Vol. XXVII JANUARY 1933 Number 1

EXCAVATING ENGINEER

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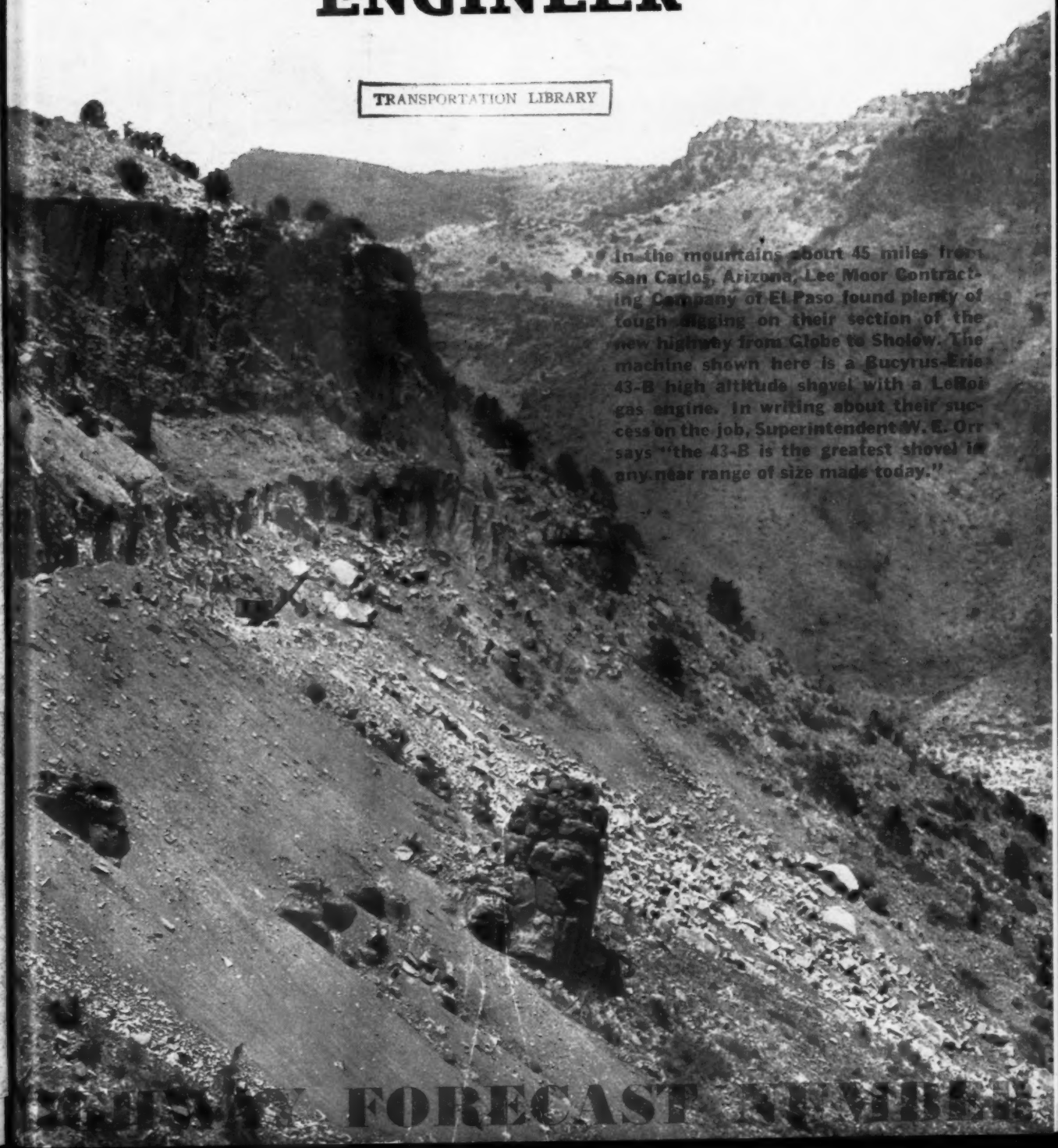


In the mountains about 45 miles from San Carlos, Arizona, Lee Moor Contracting Company of El Paso found plenty of tough digging on their section of the new highway from Globe to Sholow. The machine shown here is a Bucyrus-Erie 43-B high altitude shovel with a LeRoi gas engine. In writing about their success on the job, Superintendent W. E. Orr says "the 43-B is the greatest shovel in any near range of size made today."

EQUIPMENT FORECAST NUMBER

MOST FOR YOUR MONEY

Balanced Value
means
low-cost output

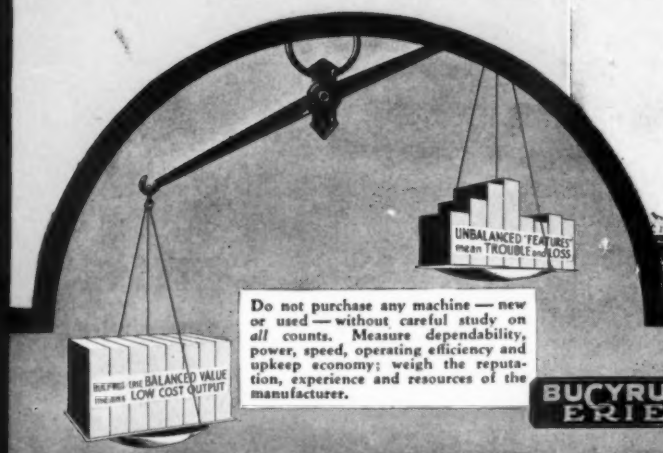
You find balanced value in every Bucyrus-Erie. Choose the one exactly suited to your job!

Size	Model	Power Choice			Type
½-yard	16-B	gasoline	Diesel	electric	fully convertible shovel, dragline clamshell, lifting crane, skimmer scoop, drag-shov
½-yard	1020	gasoline	Diesel	electric	fully convertible
¾-yard	21-B	gasoline	Diesel	electric	fully convertible
⅞-yard	B-3	steam			fully convertible
1-yard	32-B	gasoline	Diesel	electric	fully convertible
1¼-yard	GA-3	Gas + Air			fully convertible
1½-yard	37-B	gasoline	Diesel	electric	fully convertible
1½-yard	42-B	electric	steam		fully convertible
1¾-yard	43-B	gasoline	Diesel	electric	fully convertible
2-yard	50-B	steam	electric		fully convertible
2¼-1¼-yard	45-B	gasoline	Diesel		special dragline for soft ground
2¼-yard	52-B	gasoline	Diesel	electric	fully convertible

Tunnel shovels, Tower Excavators, heavy-duty draglines to 10 yards, and shovels to 18-yards; Dipper or Hydraulic Dredges Complete line of dragline buckets; also the Loadmaster utility crane and Bucyrus-Monighan Walking Draglines.

57

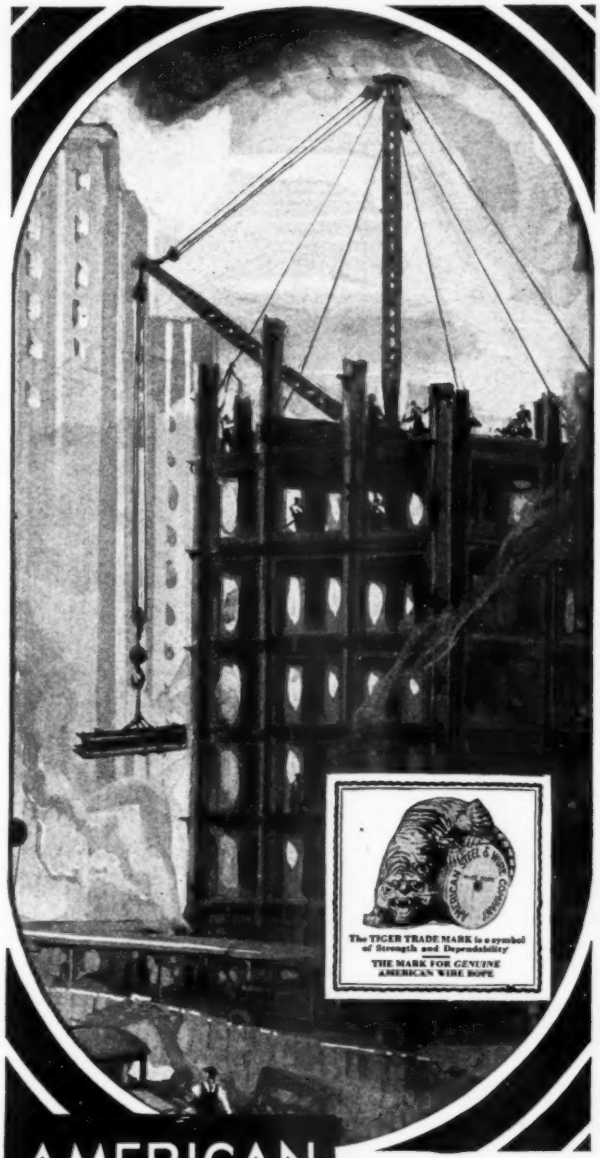
BUCYRUS-ERIE COMPANY
South Milwaukee, Wisconsin



Do not purchase any machine — new or used — without careful study on *all* counts. Measure dependability, power, speed, operating efficiency and upkeep economy; weigh the reputation, experience and resources of the manufacturer.

BUCYRUS ERIE

SEE BUCYRUS-ERIE BEFORE YOU BUY!



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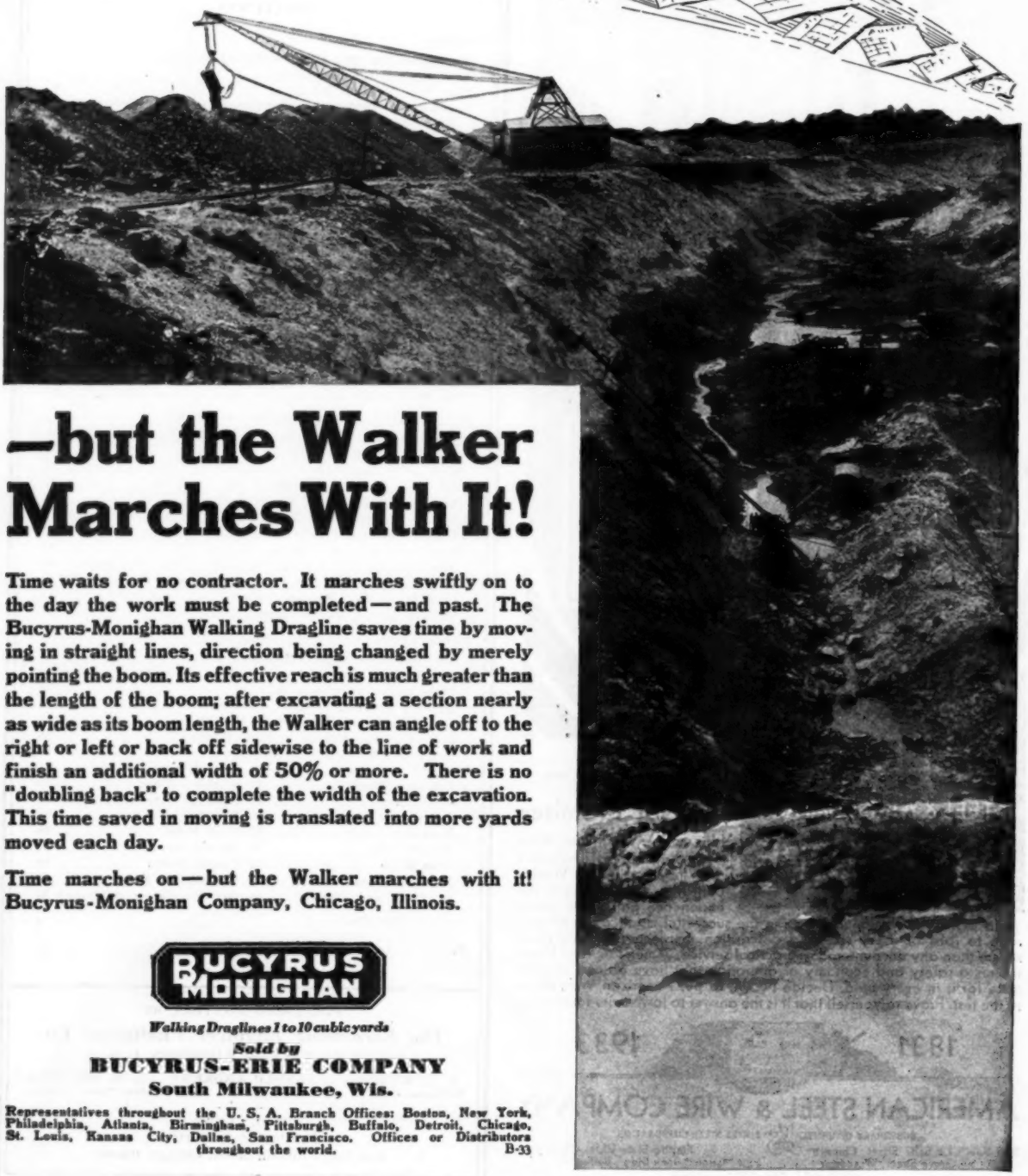

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Time waits for no contractor. It marches swiftly on to the day the work must be completed—and past. The Bucyrus-Monighan Walking Dragline saves time by moving in straight lines, direction being changed by merely pointing the boom. Its effective reach is much greater than the length of the boom; after excavating a section nearly as wide as its boom length, the Walker can angle off to the right or left or back off sidewise to the line of work and finish an additional width of 50% or more. There is no "doubling back" to complete the width of the excavation. This time saved in moving is translated into more yards moved each day.

Time marches on—but the Walker marches with it! Bucyrus-Monighan Company, Chicago, Illinois.

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HIGHWAY ENGINEERS AND CONTRACTORS

Send For This Free Book

HERE, at last, is a booklet that describes in detail the known successful methods of accelerating swamp fill settlement with explosives—the new procedure that is revolutionizing highway construction in marshy areas.

Highway engineers from all sections of the country cooperated in compiling the 84 pages of data and information, including special chapters on costs (heretofore unpublished), sounding equipment and methods, and selection of explosives.

The booklet, illustrated with many diagrams and photographs, is so complete that it can be used in the field by highway engineers and contractors.

It will be sent free to those interested. Use the coupon.

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ALLIS-CHALMERS TRACTOR

MODEL "M"

One year ago Allis-Chalmers announced the big Model "L" with its many advancements in track-type tractor design. That was the biggest tractor news of 1932.

Now comes the big news for 1933 in the track-type tractor field — the A-C Model "M"—"the baby of the family", but with the same stamina and durability so outstanding in its big brothers — the "35" and "L". For example —

- **Weighing only 6,200 pounds, the "M" delivers approximately 28 horsepower at the drawbar.**
- **The "M" has four forward speeds, ranging from 2.23 to 5.82 M. P. H.**
- **Although the most modern track-type tractor on the market, the "M" sells at a record low price for a tractor of this rating.**

The Model "M" abounds with new and improved features. Years of experience in tractor engineering are back of it. Excellence of design and construction mark every detail of its make-up—unit construction; renewable cylinder sleeves; steering clutch control; 12" track shoes; high grade anti-friction bearings throughout.

No less a sensation than its "big brother", the Model "L", the Model "M" will blaze a profitable trail to better earnings in 1933 for all who place their dependence upon it.

ALLIS-CHALMERS
TRACTOR DIVISION—MILWAUKEE, U. S. A.

Not in the Contract

Farmer: "No, I wouldn't think o' chargin' ye for the cider. That'd be bootleggin'—and' praise the Lord, I ain't come t' that yit. The peck o' potatoes'll be five dollars."

Clown. "Look here, I object to going on right after that monkey act."
Circus Master: "You're right. They may think it's an encore."

She-sez—I have no sympathy for a man who gets drunk every night.
He-sez—A man who gets drunk every night doesn't need sympathy.

Country Constable: "Pardon, Miss, but swimming is not allowed in this lake."
City Flapper: "Why didn't you tell me before I undressed?"
Country Constable: "Well, there ain't no law agin' undressin'."

Son (who has caught his father kissing the maid): "Watcha doin', Pop, kissin' the maid?"
Pop (thinking quickly): "Bring me my glasses, son; I thought it was your mother."

"Mistah Johnson, I has discovered I can't get yo yo' divorce on de grounds dat yo' marriage ain't legal, on account of her father, he had no license to carry a gun."

Willie—"Paw, does bigamy mean that a man has one wife too many?"
Paw—"Not necessarily, my son. A man can have one wife too many and still not be a bigamist.

"My husband gets up in time for the health exercises on the radio every morning."
"I didn't know he took 'em."
"He doesn't but the girl in the apartment across the court does."

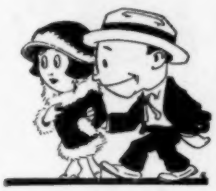
Old Lady (to street-car motorman): "Please Mr. Motorman, will I get a shock if I step on the track?"
Motorman: "No, lady. Not unless you put your other foot on the trolley wire."

Drunk, optimistically: "How long is it goin' to take to buil' tha' subway?"
"Eight years," came the answer.
Just drunk: "Eight year! (hic) T' 'ell with it. I'll take a taxi."

Little Anna asked her father why he didn't have any hair on top of his head. He answered: "For the same reason that grass won't grow on a busy street. You know why now, don't you."
"Sure," she replied, "it can't get up through concrete."

Conductor: "Can't you see the sign, 'No Smoking'?"
Sailor: "Sure, mate, that's plain enough. But there are so many dippy signs here. Looka there—one says, 'Wear Nemo Corsets'. So I ain't paying attention to any of them."

Wife: "I had to marry you to find out how stupid you were."
Husband: "You ought to have known that when I asked you."



Little Eddie: "What time does the next train come in?"
Old Station Agent: "I've told you five times that it arrives at 4:44."
Little Eddie: "I know it, but I like to see your whiskers wobble when you say '4:44'."

Flapper: "And next week I'm off to Paris to get my clothes."
Grandmother: "Yes, yes; I'd wondered where you'd left them."

"Why do you speak of your husband as a theory."
"Because he so seldom works."

Plumber: "I've come to fix that old tub in the kitchen."
Young Son: "Mama, here's the doctor to see the cook."

First Street Cleaner: "I hear you made a big killing in the stock market."
Second Street Cleaner: "Not exactly. I just cleaned up a little along the curb."

Mr. Hoover: "Why is Mr. Akerson leaving for Florida?"
Mr. Ritchey: "Just got word land was found on his property."

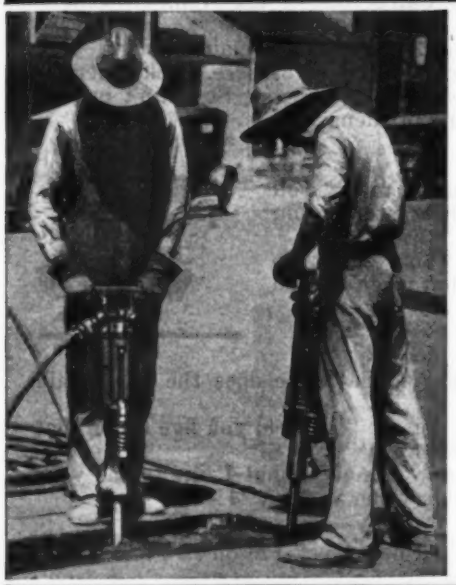
"Who are those pretty little girls?"
The village boy replied: "They are the doctor's children. He always keeps the best ones for himself."

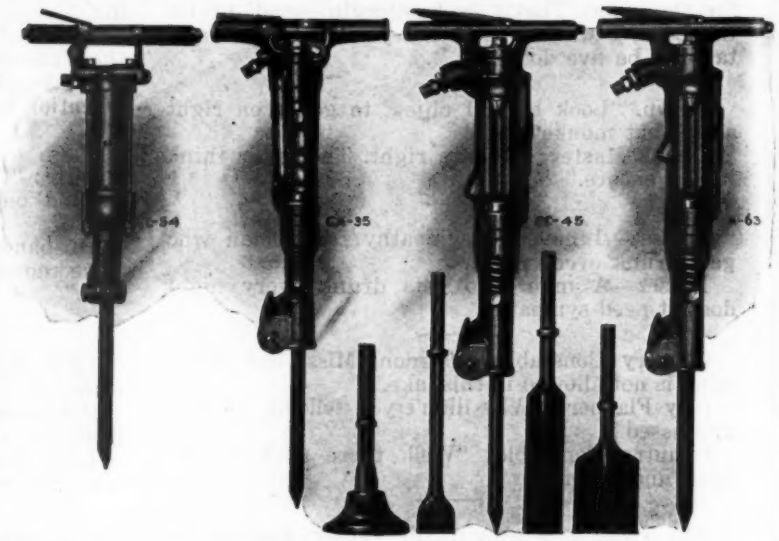
Nurse: "It's a boy."
King Solomon: "Curses—I wanted a girl."
Nurse: "Be patient, Oh King, there will be three more this afternoon."

Friend: "Why is it that your son rides in a car and you always go on the street car?"
Father: "Well, he has a rich father and I haven't."

The check that used to come back marked "No funds" now comes back marked "No Bank."

The Famous Family of I-R Paving





TODAY, **Ingersoll-Rand Paving Breakers** are used in almost every industry, but particularly in road building and paving work, construction, mining, quarrying and maintenance work. They are designed and built to withstand the severe service to which they are subjected in cutting through asphalt, concrete, hardpan, brick and rock.

There are four sizes to supply the many requirements of the various fields. While all sizes are similar in general construction, each has its particular application.

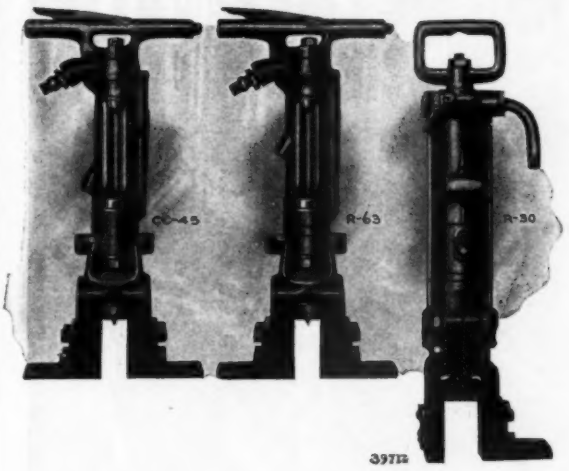
The **L-54** Paving Breaker weighs but 38 pounds, yet its exceptional power makes it an ideal light-weight tool. It works quickly and thoroughly, and has many advantages for such work as breaking down brick and concrete walls, particularly where it is necessary to work from scaffolding or places where it is difficult to get a solid footing.

The **CA-35** Paving Breaker weighs 56 pounds, and is suitable for general paving breaker service of the lighter class, such as digging in hard clay or shale, breaking brick and concrete walls and floors where it is not feasible to use a heavier tool.

The **CC-45** Paving Breaker weighs 80 pounds, and is the most widely used paving breaker in the world. It is recommended for general service in road building and repair service. It is also widely used in contracting, mining, quarrying, maintenance, and demolition work.

The **R-63** Paving Breaker weighs 80 pounds, and closely resembles the CC-45 Paving Breaker in field of service and general appearance. It has a slower, heavier blow than the CC-45, which makes the R-63 particularly suitable for demolishing the hardest concrete.

Breakers and Sheet Pile Drivers



I-R Pile Drivers are recommended for driving wooden sheet piling in any ground that piling will penetrate without breaking.

These pile drivers are used in trench work, excavations for buildings and bridge foundations, in placing piling in mine shafts and drifts—in fact, wherever openings must have support before removal of the ground.

These machines perform satisfactorily in sand, gravel, shale, or in any gradations between these soils. There are three sizes designed for 2", 2½", or 3" wooden sheet piling.

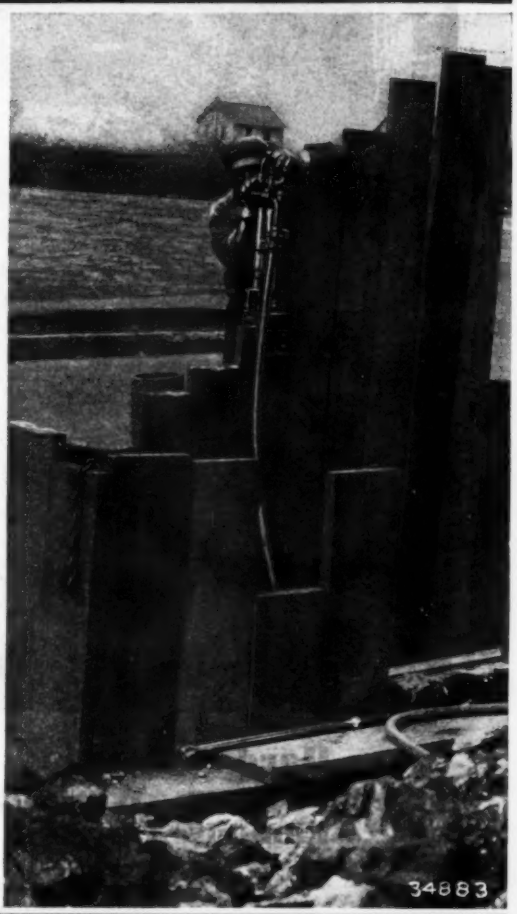
The **CC-45** Pile Driver weighs 128 pounds, and is essentially our powerful CC-45 Paving Breaker. A second handle or cross arm can be provided to facilitate handling when moving it about and also to assist in steadying it during operation.

The **R-63** Pile Driver weighs 128 pounds, and is essentially the R-63 Paving Breaker with the pile driver fronthead.

The CC-45 and R-63 are standard for 2" piling; 2½" and 3" frontheads are available.

The **R-30** Pile Driver weighs 146 pounds, and is a larger, heavier, and more powerful machine than the CC-45. It is recommended for use in harder and heavier ground requiring a machine beyond the power of the CC-45.

The R-30 is standard for 3" piling; 2" and 2½" frontheads are available.



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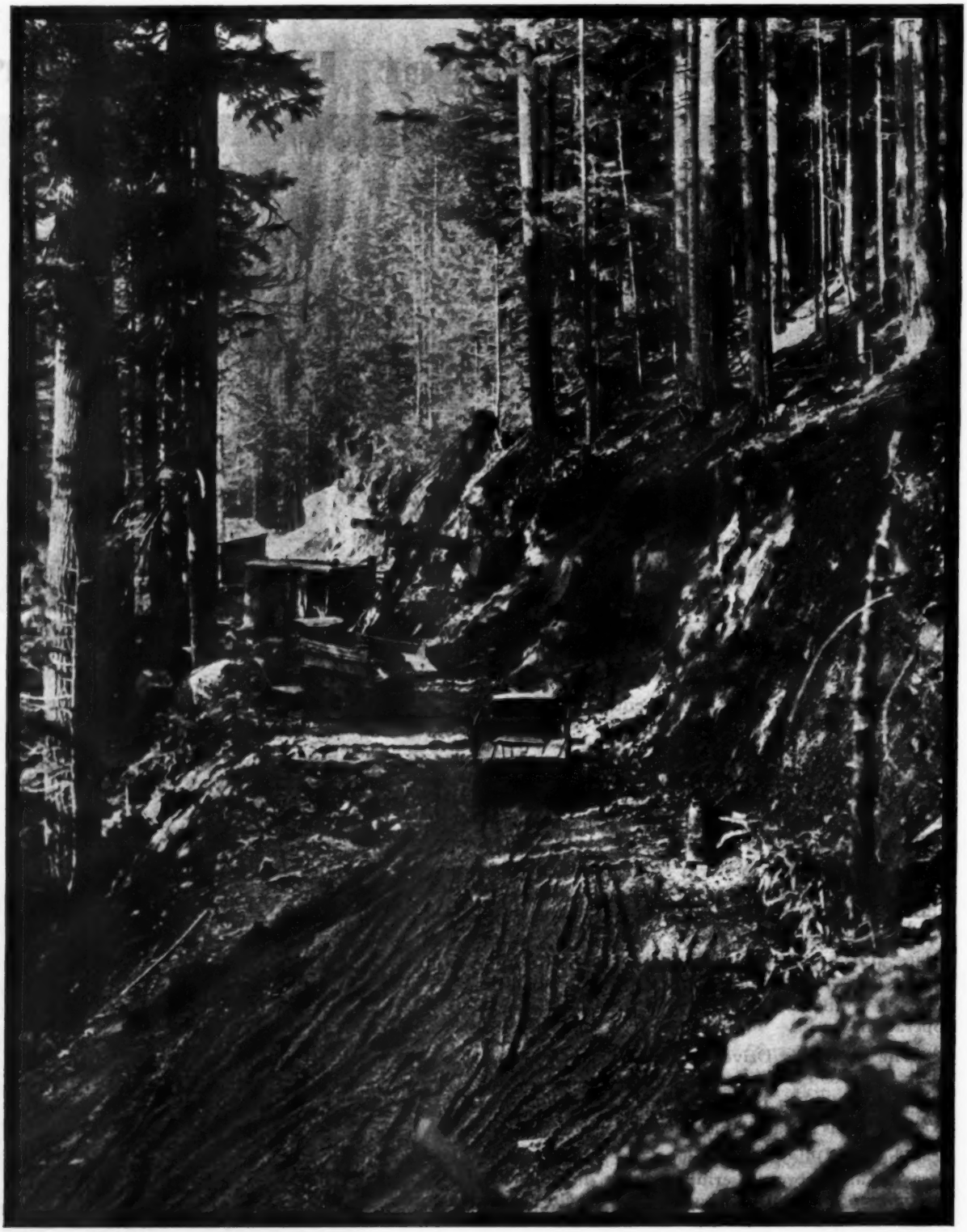

Hard Digging in Western Washington's Famous National Park

Scenic beauty and difficult road work abound in the $10,000,000 highway program started this past season in Rainier National Park. The above illustrates a section of work handled by one of Myers & Goulter's 1-yard Diesels on their Chanapecosh job. Next season's work in Rainier National Park will probably include 15 to 20 miles of grading and clearing of the heaviest type with costs running up as high as $100,000 per mile. Equipment used this past season by Myers & Goulter on Mt. Rainier included Bucyrus-Erie shovels; Linn tractors; International, White and Ford trucks; and Ingersoll-Rand, Gardner-Denver and Sullivan compressors. Dupont and Giant explosives were used.

EXCAVATING ENGINEER
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Excavation for 1933 Highway Construction with summary of 1932 roadbuilding

Division of Highway Revenues Threatened in many States . . Unemployment Relief on Highway Construction Likely to Suffer Heavily in Economy Drive

EARLY returns indicate that income from motor taxes will be reduced this year for the first time since the highway transportation industry swung into full stride. A decrease in both license fee and gasoline tax income is anticipated because of economic pressure which has materially curtailed car sales.

While the total 1932 automobile registrations are not yet available there will probably be 1,000,000 fewer cars than in 1931, or a total of 25,000,000. Some $14,000,000 in license fee income to the states will be lost through this reduced registration. The disappearance of 1,000,000 cars from the roads can be expected to bring a reduction of nearly 500,000,000 gallons in gasoline consumption.

A serious problem, therefore, confronts state highway departments faced with lowered motor tax income. This is particularly true where road funds are being diverted from job-giving road work to education, unemployment relief and other functions not for the benefit of road users.

In addition, even with an annual appropriation of $125,000,000 by Congress in continuing the regular Federal Aid, the states will have less Federal money for roads than in 1932, because emergency Federal road advances and loans from the Reconstruction Finance Corporation must be repaid to the Federal Government from future Federal Aid allotments.

According to the American Association of State Highway Officials only 40 per cent of the roads on all the state highway systems had a dustless surface or better January 1, 1932. And there was only 99,538 miles of pavement on all the state highway systems out of a total mileage of 347,867.

About 14 per cent of all roads are on the state highway systems, whereas 5 years ago state systems included only 10 per cent of the total mileage. This growth in mileage has resulted in increased costs to the states.

"In August, 1932, an average road building month," says W. C. Markham, Executive Secretary of the Association of State Highway Officials, "333,000 men were employed in state highway work directly on the job, including Federal Aid projects. This means that one out of every 367 persons in the United States was earning his livelihood through state road construction by direct work, while there were at least two men preparing and transporting material to the jobs, making in all at least

This Linn tractor is taking a load near the summit of White Face Mountain out of Wilmington, New York, on what is considered the toughest road job in the state in 1932. The new road, known as the World War Veterans Memorial Highway, will be eight miles long with a rise of close to 4,000 feet. Average grade 9%. Excavating was handled by the Williamson-Howard Construction Company of Youngstown, Ohio.

1,000,000 men given employment for state road work only. If for no other reason than the provision of jobs Federal Aid should be continued on its present basis."

There is none of its activities which the Federal Government can contemplate with more satisfaction than its participation in the construction of interstate highways. The very highest standards of efficiency and honesty have marked the administration of funds set aside by Congress for the purpose of establishing a national system of highways. Every dollar expended has been accounted for, and the people have tangible evidence that their money was used in the creation of a capital investment which, year in and year out, is paying more than an ample dividend.

One does not have to be an economist to comprehend that any investment which returns its cost with a profit is a good one; appropriations for highways will stand that test. If Congress and Legislatures view all appropriations from the standpoint of whether they have justified themselves as profit-producing ventures without regard to political expediency the budget problem can be quickly solved without crippling valuable work.

Highway construction appropriations will assist the public through the construction of necessary roads; the funds will provide more employment with higher returns to labor than any other undertaking in which the Government might engage.

Alabama

Information on 1932 construction will not be available until data is compiled for the annual report about March 1st.

Arizona

The Arizona State Highway Department wires that it is impossible to furnish a forecast for 1933 at the present time.

Arkansas

As of December 31, 1932 the Arkansas State Highway system consisted of the following:

	Miles Complete	Miles Under Constr. or Commitment	Totals
Concrete Pavement	873.93	29.19	903.12
Asphaltic Pavement	571.60		571.60
Asphaltic Retread	336.20		336.20
Gravel	5424.04	2.20	5426.24
Graded	825.85	24.15	850.00
Unimproved	636.13		636.13
Through Towns and Cities (Unclassified)	175.11	2.25*	177.36
	8842.86	57.79	8900.65

*Concrete Pavement

Carried over into 1933 on existing contracts were $600,000 of active and inactive 1931 awards, $900,000 of 1932 awards (all active). Of this $1,500,000 there is $800,000 in road work under commitment and $700,000 in bridge work. In addition there is a balance available for 1933 construction of $2,700,000.

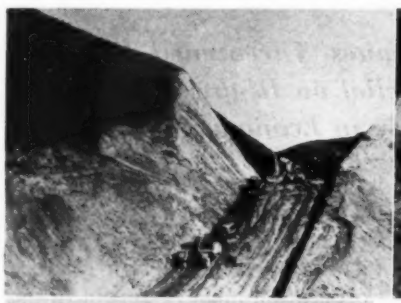
On the San Bernardino National Forest Highway, Crook and Henno of Los Angeles used this Bucyrus-Erie 37-B and a Bucyrus-Erie 42-B steamer to cut through the rocky mountain sides. Their contract, known as the Mill Creek job, was near Redlands.

Construction funds for 1932 are composed of the normal Federal Aid apportionment of $2,100,000 made available July 1, 1932 and matched with funds of the Emergency Relief and Construction Act of 1932 in the same amount. Construction funds in 1933 will be augmented by the normal Federal Aid apportionment of $2,100,000 available July 1, 1933 if sufficient revenue is obtained to match such apportionment.

The 1933 program will consist of grading, gravel surfacing, bituminous retread surfacing, portland cement concrete paving and bridge work to the extent of construction funds that are available.

California

The Department of Public Works is preparing a budget to be submitted to the legislature when it convenes in January. Until action is taken by the legislature on this budget it is impossible to estimate the amount of work to be undertaken during the coming year.



Left: Peterson & Isgren use an Allis-Chalmers Model L to pull the big 7 yard Le Tourneau scrapers in this cut at Carbon Canyon in southern California. This is an especially good example of work they are doing in California with tractors, scrapers and bulldozers. Right: Just back in the truck and take it away. Charles Harlowe, Jr. of Oakland found plenty of tough digging like this along his section of the Carson Cutoff between Pain Flat and Mariposa. Below: J. P. Holland, Incorporated, of San Francisco, worked two Bucyrus-Erie 37-Bs and a Gas+Air on this road through Cajon Pass in San Bernardino County.

In 1932 California carried to completion 153.7 miles of Portland cement concrete, 72.2 miles asphaltic concrete, 56 miles of untreated crushed gravel or stone, 233.5 miles bituminous or oil treated crushed gravel or stone and 53.4 miles graded roadway. Approximately $24,500,000 was spent for construction and reconstruction during 1932.

Work under way as of January 1st, 1933 consists of 58 miles of grading, 126 miles oil treated or bituminous treated surfacing, 39 miles asphalt concrete pavement and 145 miles portland cement concrete pavement, requiring to complete an expenditure of $9,300,000.

Work remaining in the budget for this biennium to be undertaken the first six months of 1933 consists of 59 miles of paving, 25 miles of surfacing, 14 miles of grading at an estimated cost of $5,600,000.

$4,667,188 was appropriated to the State under the Federal Relief Act of which all except approximately $500,-

000 has been applied for either by contract underway or work now advertised for bids.

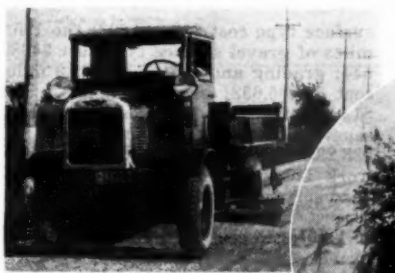
Colorado

There are no forecasts available from the State Highway Department of Colorado but it is interesting to note that Colorado citizens voted two to one in the recent election to maintain the present gas tax level of four cents a gallon as against the proposal to reduce the tax to three cents. Colorado has a State Highway system of 9,255 miles of which only 447 miles were paved and 3948 miles surfaced with untreated macadam or gravel at the beginning of 1932.

While the reduction of one cent in the tax rate would have crippled highway building through lessening road income by $1,500,000 it would have saved the average road user only about $4.00 per year or a little less than 1c a day. Not only would Colorado have lost the value of improved roads secured for the $1,500,000 reduction in gas tax but Colorado labor would have lost $1,350,000 in wages based on figures of the U. S. Bureau of Public Roads which calculates that 91 per cent of the cost of road building goes to workers employed on the roads or in the supplying of material and equipment.

Connecticut

Executive Deputy Commissioner C. G. Nichols of the Connecticut Highway Department advises that the Department is unable to give any details concerning their 1933 road program until after this has been passed on by the legislature. So far as revenue is concerned the Connecticut Highway Department depends for funds on the gasoline tax, receipts from motor vehicles, motor vehicle licenses, fees and fines.



Maintenance in Palestine is illustrated in the picture at the right which was furnished by M. E. Giersbach, FWD representative in Palestine. Says Mr. Giersbach: "Seems to me that you fellows back in the States will have to trim your prices per mile down a bit to even approach the efficiency of the local system, which I dare say is less than a dime per mile. This 1932 model "Jackass Special" keeps the roads in excellent shape. Of course, much of our travel is across-country over lava rocks and sand, but when we do get on the highway, we have to be careful of the local patrol man and his maintainer. He has few worries as to blade pressures and operating costs and his chief concern is a new supply of brush as the current one wears away. The larger limbs are saved for firewood, so really, there is little waste when replacements are necessary. Speed, of course, is not a factor, nor is horsepower, drawbar pull, or miles per gallon." A Four-Wheel Drive road patrol typical of U.S.A. methods is shown above.

Delaware

In 1932 Delaware graded a total of 120 miles of highway costing $2,080,000. 40 miles of this costing $518,000 came from Federal Aid funds, 40 miles costing $600,000 from Emergency Federal Relief funds and state roads comprising the remaining 40 miles cost $900,000. It is estimated that about 900,000 cubic yards of excavation was required in the grading of new highways and about 100,000 cubic yards in the reconstruction and widening operations. About 160,000 cubic yards of excavation contracted for in 1932 will be carried over into 1933 and it is estimated that this will cost about $90,000. This is a high figure for Delaware but is due to a considerable volume of this work being planned for hand labor in connection with unemployment relief. In addition, under the Federal Emergency Relief Appropriation there will be let, to be completed before July 1, 1933, about $70,000 worth of additional road work which will probably involve about 20,000 cubic yards of excavation. In 1932 Delaware completed 94 miles of paving at a cost of $1,800,000 and 6 miles of gravel costing $32,000.

In 1933, Samuel Knopf, Principal Assistant Engineer of the Delaware State Highway Department, estimates that they will probably grade and surface 110 miles of new roads consisting of about 50 miles of Federal Aid and 50 miles of State roads and in addition take care of 30 miles of reconstruction on Federal Aid roads. This work will probably involve about 400,000 cubic yards of excavation in the new construction and 15,000 yards in the reconstruction. About half of this work will be suitable for power shovel handling. It is expected that Delaware will pave about 50 miles in 1933 at a cost of $1,200,000 and surface with gravel or crushed stone about 60 miles at a cost of $800,000. This 1933 program will probably equal that carried on in 1932.

Florida

The State Road Department of Florida wires that it is unable to furnish either a forecast or construction summary at this time.

Logging roads have to be graded, too. Here is the way the Fruit Growers Supply Company of San Francisco do it out near Camp 10 which is 35 miles out of Susanville. H. Bauman, Woods Superintendent, at Camp 10 is in charge of this grading operation.

Georgia

No plans have been formulated at the time of writing by the State Highway Board of Georgia for 1933 highway construction.

Idaho

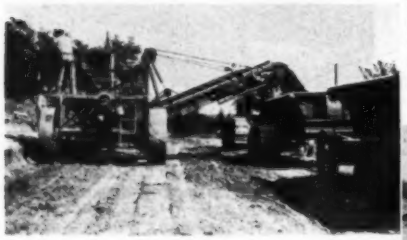
In 1932 Idaho graded and reconstructed a total of 227 miles of highway. $212,985 was used for new grading from Federal Aid funds; $327,853 came from the Emergency Federal Relief funds and $134,584 went into new grading on state roads. Reconstruction involved an expenditure of $35,299 of Federal Aid, $170,218 of Emergency Federal Relief funds and $2,660 of purely state road expenditure. The new grading involved excavation of 2,407,550 cubic yards, while the reconstruction required the moving of 730,650 yards. A considerable part of Idaho's work was let late so that 1,583,100 yards will be carried over to be completed during 1933. This will involve

James Vinchette of Rock Hill, Connecticut took 1000 to 1200 yards of gravel out of this pit every ten hours. The gravel was loaded to a fleet of 17 dump trucks which had an average haul of two miles.

the cost of $498,071. In addition there is still unexpended $350,000 in the Emergency Federal Relief funds which will probably be used for work to be completed before July 1st of this year. It is estimated that this will probably involve an additional 300,000 cubic yards of excavation.

In 1932 Idaho completed four miles of paving at a cost of $94,000 and also completed 480 miles of oil treated gravel or stone at a cost of $768,000.

It is impossible to further forecast at this time the new 1933 program because of the uncertainty as to the amount of Federal Aid and gas tax money which will be available.



Anderson Bros. of Rockford, Illinois, had some tough work on their subcontract 9 miles out of Rockford for Arcole Construction Company. Large sections consisted of old block top which had to be torn up. The above Western No. 6 elevating grader loaded the material to Western wagons. According to the contractors no other machine they ever owned could have done the work. A "stiff leg" by which the operator can force the plow into the ground and hold it there made the successful handling of this job possible.

Illinois

A wire report from Frank T. Sheets, Chief Highway Engineer, lists as completed this year approximately 720 miles paving, 180 miles grading, 160 bridges on State highways, and 800 miles surfacing. In addition 200 miles grading and 170 bridges were completed on County highways.

Indiana

The Indiana Highway Commission

Darrow & Barron of Waukegan, Illinois, uses this Blaw-Knox Ateco combination of Tamping Roller and Bulldozer on a Caterpillar Thirty-Five on this Illinois highway, west of Waukegan. The clay packed so firmly that the feet of the sheep foot tamper would not sink more than half their length.

wires: "Summary 1932 construction not available until February, 1933."

Iowa

During 1932 the Iowa State Highway Commission built 326 miles of concrete paving, 436 miles of graveling, 307 miles of grading, 135 miles of bituminous gravel and 1858 bridges and culverts. The total expenditure was $14,357,091.

As to a forecast for 1933 a very substantial part of the funds must of necessity come from the Federal Aid appropriation. If the regular appropriation is made it is probable that Iowa will have approximately $6,000,000 available for construction work for 1933. The tentative program contemplated includes 275 miles of grading work and about 125 miles of paving work. It is probable that the total excavation on this program will amount

And near Geneseo, Illinois, Hartman-Clark did this beautiful job of shouldering with an Allis-Chalmers Model L tractor and No. 1½ power control grader. The grader cut three inches deep and eight feet wide on each side of the center strip of pavement, then wasted the dirt into the ditch and over the back slope.

to 10,000,000 cubic yards.

It is interesting to note that in the consolidated report of Oscar Anderson, State Budget Director, Iowa's primary road system is valued at $233,681,744 or better than two-thirds of her whole amount of tangible assets which are estimated at $344,350,165.

Kansas

Kansas in 1932 constructed 2,170 miles of Federal Aid highway at an expenditure of $1,284,759 as well as 7½ miles of state highway costing $23,886. A total of 6,500,000 cubic yards of excavation was involved in this program. Kansas carries over into 1933 over a million yards of excavation in uncompleted contracts to cost approximately $200,000. Still has available in Emergency Federal Relief Funds for highway construction $1,210,000. It is expected that this will take care of construction involving about 800,000 cubic yards of excavation. During 1932 Kansas paved 55.6 miles costing $1,000,000 and graveled 619.4 miles at a cost of $800,000.

No forecast of 1933 plans are available from the State Highway Commission. It is probable that during the coming session the state legislature will make considerable adjustment in the income of this department which may materially effect the volume of work which the commission can do. Excavating Engineer estimates that Kansas will show a considerable decrease in road work during 1932, probably about 40%.

Kentucky

The State Highway Commission wires that they are unable to furnish information at this time regarding their 1933 program.

Louisiana

The extensive road program carried on by the Louisiana Highway Commission during 1932 involved a total construction and improvement of 1743.6 miles of highway at a cost of $26,113,693. Construction of 837.8 miles of hard

Hartman-Clark Brothers Company of Peoria, who completed 125 miles of concrete highway during 1932, used this new Western Shouldering Machine to build this excellent grade near Gibson City, Illinois. The Shouldering Machine is a Western No. 6 elevating grader with a removable attachment in place of the plow for shaping the shoulders. It can be quickly converted back into an elevating grader. A Caterpillar tractor does the hauling.

surface type cost $19,840,693; the 195.9 miles of gravel surface type cost $438,644; grading and gravel on 421.9 miles cost $1,865,632; grading on 283.7 cost $1,930,489, while bridges and grade separations totaling 4.3 miles cost $2,038,233. In addition to this completed work Louisiana carries over into 1933 hard surface construction on 482.5 miles to cost $9,655,290; gravel surfacing on 77.1 miles to cost $126,431; grading and gravel on 112.7 miles to cost $759,214; grading on 203.9 miles to cost $1,792,685; and bridges and grade separations of 11.9 miles to cost $6,285,241. This brings the total work carried over to a total of 888.1 miles to cost $18,618,863.

In the above tabulation of work completed are included four major bridge projects, viz., the bridge over Red River at Coushatta, bridge over the Ouachita River at Sterlington, bridge over Industrial Canal at New Orleans, and bridge over Mermentau River at Lake Arthur, at a cost of approximately $1,158,000.

296 miles of the 482.5 miles of hard-surfacing shown in the above tabulation of work under construction and to be carried over to 1933, has been laid, but has not been accepted as of December 4, 1932.

The Louisiana Highway Commission is not in a position at the present time, to give a complete statement of their road program for the year 1933, as any

(Continued on Page 14)

January 16-20, 1933

Highway and Building Congress

Detroit, Michigan

THE leading national organizations interested in highway and building activities are joining forces in the Highway and Building Congress in Detroit, during the week of January 16, 1933. This is the first time that a combined meeting of all branches of highway and building construction will consider their mutual problems.

According to recent census figures, the normal business volume of construction totals $6,000,000,000 annually, and employs 3,000,000 persons directly and indirectly. This is the activity represented by the Highway and Building Congress.

The Highway and Building Exposition-Road Show, featuring equipment and materials used in the construction, operation and maintenance of highways and buildings, will be at the Municipal Airport.

The Joint Exposition of machinery, equipment and supplies used in the production, distribution and consumption of crushed stone, sand and gravel and ready mixed concrete, will be at the Book-Cadillac Hotel.

The exhibitions are educational in character—both the equipment and material exhibits and those of the technical departments of the Federal Government and the States—and are designed to aid the engineer, the contractor, and the public official to meet present conditions of highway and building finance, construction, maintenance and operation.

The exhibit of the Bureau of Public Roads is always an outstanding feature, illustrating progress in highway development and portraying the practical benefits resulting from extensive research operations.

AMERICAN SOCIETY OF MUNICIPAL ENGINEERS
St. Louis, Missouri

Thirty-eighth Annual Convention
January 16, 17, 18
HEADQUARTERS—HOTEL STATLER

Jan. 16— Board of Directors' Meeting
Jan. 16—10.00 a. m.—Formal opening of convention
1.00 p. m.—City Planning—Airports and Landing Fields
Jan. 17— 9.30 a. m.—Specifications Committee Reports.
Municipal Engineering Personnel
Municipal Field Engineering
1.30 p. m.—Sewerage and Sanitation
Refuse Disposal and Street Cleaning
Jan. 18— 9.30 a. m.—Street and Traffic Lighting—Traffic Control—Water Works—Public Utilities
1.30 p. m.—Municipal Legislation and Finance—Street Paving, Design, Construction and Maintenance
Opportunity to visit and inspect projects coming under the above subjects will be provided.

HIGHWAY RESEARCH BOARD
OF THE
NATIONAL RESEARCH COUNCIL
Washington, D. C.

HEADQUARTERS—FORT SHELBY HOTEL
January 15

Meeting of Executive Committee and representatives of member organizations.

HIGHWAY CONGRESS DAY
January 19
Masonic Temple

MORNING AND AFTERNOON SESSIONS
"Highway Program of the Nation; Its Present Status and the Outlook for the Future"
"Importance of Highway Transportation to Economic Recovery"
"Correlation of Different Forms of Transportation"
"What Highways Mean to the Economic, Educational and Social Life of the United States"
"Highways are Self-Liquidating Projects"
"Diversion of Motor Vehicle and Gasoline Tax"
"The Interest of the Agricultural Industry in Adequate Highways"

NATIONAL ASSOCIATION OF BUILDERS EXCHANGES
Washington, D. C.

HEADQUARTERS—FORT SHELBY HOTEL
January 17, 18
Jan. 17— 2.00 p. m.—Meeting, Board of Control
Jan. 18—10.00 a. m.—Open Forum
2.00 p. m.—Report of Officers and Committees
Election of Officers
Election, Board of Control Members
Appointment of Executive Committee
Appointment of Executive Secretary, Assistant Secretary and/or Treasurer and General Counsel

NATIONAL PAVING BRICK ASSOCIATION
Washington, D. C.

Twenty-seventh Annual Meeting
January 17, 18
HEADQUARTERS
BOOK-CADILLAC HOTEL
Jan. 17—10.30 a. m.—Registration
10.30 a. m.—Board of Governors' Meeting
12.00 Noon—Luncheon
2.00 p. m.—Annual Meeting of Members
Reports of Officers
Open Forum
Jan. 18— 9.30 a. m.—General Session—open to the Public
1.30 p. m.—General Session
Those interested in street and highway development are invited to attend. The program will be presented by engineers, contractors and paving authorities.

AMERICAN INSTITUTE OF STEEL CONSTRUCTION, Inc.
New York, N. Y.

Meeting Plans not completed
Further particulars may be obtained by writing the Institute.

AMERICAN WELDING SOCIETY
Detroit Section

Meeting plans not completed
Further particulars may be obtained by writing the Detroit Section of the Society

BUILDING CONGRESS DAY
January 20
Statler Hotel

MORNING AND AFTERNOON SESSIONS
"Unifying the Construction Industry"
"Advantages of a Unified Industry to the Subcontractor"
"Today's Labor Problem Applied to Construction"
"Coordinating Construction Industry Legislation"
"Prequalification in Construction"
"Economic Recovery Via the Construction Route"
"A Six Year National Construction Program"
"Failure of Finance in the Field of Construction"
"Rebuilding Blighted Areas—Effect Upon Economic Conditions"

NATIONAL CRUSHED STONE ASSOCIATION
Washington, D. C.

Sixteenth Annual Convention
January 16, 17, 18
HEADQUARTERS—BOOK-CADILLAC HOTEL
Jan. 15—Directors' Meeting
Jan. 16—General Session
Jan. 17—General Session
Jan. 18—General Session

NATIONAL COUNTY ROADS PLANNING COMMISSION
Washington, D. C.

HEADQUARTERS—FORT SHELBY HOTEL
The National County Roads Planning Commission will present a report supplementing previous reports upon highway planning.
The report this year will contain the Commission's recommendations for a final structure and a twelve-year budget to carry on a program of roads in Morris County, New Jersey, in order to complete a comprehensive system of highways in that county. Morris County was one of the counties given intensive study by the Commission.

THE ASPHALT INSTITUTE
New York, N. Y.

HEADQUARTERS—FORT SHELBY HOTEL
January 18
MORNING SESSION
Asphalt Industry Conference
"Characteristics of Asphaltic Road Products with Reference to Their Use"
Conference Attendance Restricted to Representatives of Asphalt and Road Oil Producers

Materials Handling Institute
with
Materials Handling Division
of
American Society of Mechanical Engineers
cooperating
New York, N. Y.

Jan. 16—Morning Session
Use of Continuous Conveying Equipment in Handling of Dirt in Construction
Use of Continuous Conveying Equipment in the Handling of Concrete in Construction
New Methods of Handling Material in Concrete Road Building
Improvements in Concrete Road Machinery
Jan. 16—Afternoon Session
Materials Handling on Modern Skyscrapers
Automatic Mixing of Concrete
Improvements in Elevators and Their Use in Building Construction and in the Finished Building

SPONSORING ORGANIZATIONS

In addition to the twenty-two participating organizations, the following associations are endorsing the Highway and Building Congress activities:

American Association of State Highway Officials
American Concrete Institute
American Institute of Consulting Engineers
American Motorists Association
American Petroleum Institute
Common Brick Manufacturers Association of America
Canadian Good Roads Association
National Highways Association
National Lime Association
National Lumber Manufacturers Association
Producers' Council
Wire Reinforcement Institute

NATIONAL RURAL LETTER CARRIERS ASSOCIATION
Niles, Michigan

HEADQUARTERS—STATLER HOTEL
HIGHWAY CONFERENCE
"Highways and the Rural Mail Service"
Open meetings daily for conference of Executive Committee with delegations from State associations of rural letter carriers.

ASSOCIATED GENERAL CONTRACTORS OF AMERICA
Washington, D. C.

Fourteenth Annual Convention
January 16, 17, 18
HEADQUARTERS—STATLER HOTEL
Jan. 15—Cabinet Meeting
Jan. 16—Governing Board Meeting
Registration and Opening of Convention
Jan. 17—General and Divisional Sessions
Jan. 18—General Session

CONSTRUCTION LEAGUE OF THE UNITED STATES
Washington, D. C.

January 16
HEADQUARTERS—STATLER HOTEL
9.30 a. m.—Meeting of Policy Committee Assembly
The program of the Construction League will consist of seven subjects, tending toward the unification of the construction industry, having special stress upon intra-industrial problems.

HIGHWAY AND BUILDING EXPOSITION ROAD SHOW
CONSTRUCTION AND MAINTENANCE EQUIPMENT AND MATERIALS
under the auspices of
AMERICAN ROAD BUILDERS' ASSOCIATION
Municipal Airport
January 16, 17, 18, 19 and 20, 1933

NATIONAL SAND AND GRAVEL ASSOCIATION
Washington, D. C.

Seventeenth Annual Convention
January 16, 17, 18
HEADQUARTERS—BOOK-CADILLAC HOTEL
Jan. 15—Directors' Meeting
Jan. 17—General Session
Jan. 18—General Session

PORTLAND CEMENT ASSOCIATION
Chicago, Illinois

HEADQUARTERS—BOOK-CADILLAC HOTEL
Meetings of the Board of Directors and of the District Engineers are planned to be held at the Book-Cadillac Hotel during the period of the Congress on dates to be selected.

JOINT EXPOSITION OF MACHINERY, EQUIPMENT AND SUPPLIES
under the auspices of
NATIONAL CRUSHED STONE ASSOCIATION
NATIONAL READY MIXED CONCRETE ASSOCIATION
NATIONAL SAND AND GRAVEL ASSOCIATION
Book-Cadillac Hotel
January 16, 17, 18, 19 and 20, 1933

AMERICAN ROAD BUILDERS' ASSOCIATION
Washington, D. C.

Thirtieth Annual Convention
January 16, 17, 18
HEADQUARTERS—STATLER AND FORT SHELBY HOTELS
Jan. 16— 2.00 p. m.—General Session—Two-minute County Officials' Session
Jan. 17—10.00 a. m.—General Session—Low Cost Roads
City Officials' Session
2.00 p. m.—County Officials' Session
City Officials' Session
Jan. 18—10.00 a. m.—General Session—Types, Culverts and Low Cost Roads
Equipment
Motor Freight Session
2.00 p. m.—General Session—Equipment
Motor Freight Session
Pan American Session
Banquet Session
All sessions, with the exception of the Pan American and Banquet, will be held in the Statler Hotel. The Pan American and Banquet will be held at the Statler Hotel.

INTERNATIONAL ASSOCIATION OF PUBLIC WORKS OFFICIALS
Chicago, Illinois

January 17
Committee on Street Maintenance Unavoidably participating in City Officials' Division, A. R. B. A. Session

ASSOCIATED EQUIPMENT DISTRIBUTORS
Cincinnati, Ohio

HEADQUARTERS—HOTEL STATLER
January 15, 16
Fourteenth Annual Meeting

NATIONAL READY MIXED CONCRETE ASSOCIATION
Washington, D. C.

Third Annual Convention
January 17, 18
HEADQUARTERS—BOOK-CADILLAC HOTEL
Jan. 17—Directors' Meeting
Jan. 18—General Session

STEEL FOUNDERS' SOCIETY OF AMERICA, Inc.
New York, N. Y.

Thirty-first Annual Meeting
January 19
HEADQUARTERS—STATLER HOTEL
TWO GENERAL SESSIONS
For further particulars make application to the Society.

Joint Meetings of
TRUCK ASSOCIATION EXECUTIVES OF AMERICA
Indianapolis, Ind.
SOCIETY OF AUTOMOTIVE ENGINEERS
New York, New York
UNIFORM COMMITTEE OF AUTOMOTIVE ADMINISTRATORS OF NORTH CENTRAL STATES REGULATORY COMMISSIONS

Jan. 17—Fort Shelby Hotel
"National Reciprocity of License Plates"
Joint conference between Uniform Committee of Automotive Administrators of North Central States and Truck Association Executives of America.
Jan. 18—Municipal Airport
"National Regulatory Uniformity in the Operation of Commercial Vehicles in Highway Transportation"
Joint conference between Soc. of Automotive Engineers, Uniform Com. of Motor Vehicle Administrators of North Central States and the Regulatory Commissions.

(Continued from page 12)

Clearwater Gravel Company of Bagley, Minnesota, turns out a mighty fine grade of gravel for surfacing or aggregate. Here's the way it looks going into a car of "bank-run."

extensive construction program will depend upon sale of the remainder of the authorized highway bond issue. This depends upon a more favorable bond market.

Louisiana's program for 1933, predicated on available funds, will consist principally of the completion of the work in progress, the construction of a relocation of the Old Spanish Trail between Rigolets and Pearlington; also the construction of some of the most urgently needed bridges, grade separations, and sections of farmers' roads. The major objective, the relocation of the Old Spanish Trail between Rigolets and Pearlington, will consist of the construction of nine miles of heavy marsh work and six large bridges including the interstate bridge over East Pearl River at Pearlington. This work will cost approximately $1,300,000 and when completed will shorten the distance between New Orleans and Bay St. Louis approximately twenty miles.

Maine

During 1932 Maine graded 102 miles of Federal Aid Highway at a cost of $2,618,000 and in addition used Emergency Federal Relief funds to grade 54 miles costing $1,566,000. 15 miles of State Road was graded at a cost of $350,000 and it is estimated that approximately 400 miles of local roads were graded at a cost of $4,000,000. Excavation involved in the above construction of new roads will probably total about 4,400,000 cubic yards. There will be carried over into 1933 about 200,000 cubic yards on uncompleted contracts. Maine has utilized the full amount of the Federal Emergency Relief funds available so that there will be no additional work to be let under the present appropriation during the first half of 1933. During 1932 Maine paved 73 miles at a cost of $1,818,000 and graveled 444 miles at a cost of $4,800,000.

Expenditures for 1933 will depend upon the amount of money appropriated by the legislature in its coming session and the amount of Federal Aid funds available. Inasmuch as both of these factors are still uncertain it is impossible to make any forecast at this time. It is probable, however, that Maine will show a decrease in highway construction for 1933.

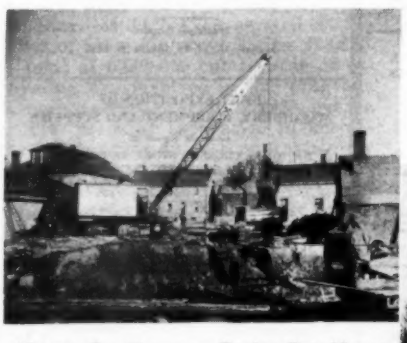
Maryland

Grading of new roads in Maryland for 1932 involved a total expenditure of about $448,000 and in addition $315,600 for reconstruction, widening and so forth. Of the new roads 26.53 miles was furnished by $95,800 of Federal Aid funds while 13.05 miles came out of $45,500 Emergency Federal Relief funds. The balance of new grading, 103.72 miles, was on state roads and involved an expenditure of $306,700. Federal Aid funds of $170,100 took care of 50.26 miles of widening and $145,500 of State funds was used for the remaining 52.31 miles. The 1932 program also involved 157 miles of paving and 75 miles of graveling. Maryland still has available $500,000 of Emergency Federal Relief funds which have not been taken up.

1933 construction is entirely dependent upon the action of the State Legislature which convenes in January, February and March and it is impossible at this time to make an intelligent forecast as to Maryland's road work for the coming year.

Massachusetts

While the program of the Department of Public Works of this Commonwealth will depend entirely upon the appropriations made by the coming legislature, it is probable that the 1933 work will show a decrease of 30% under that of 1932. On this basis it is expected that Massachusetts will grade about 50 miles of new road to cost $2,000,000 which it is estimated will be made up of 15 miles of Federal Aid highway costing $1,000,000; 10 miles of State road costing $500,000 and 25 miles of county and local roads costing $500,000. Reconstruction will probably involve 125 miles to cost some $2,000,000. About 15 miles of this will be Federal Aid at a cost of $400,000; 10 miles of State roads at a cost of $100,000 and approximately 100 miles of local roads to cost $1,500,000. It is expected that this program would require about 2,000,000 cubic yards of excavation on new roads and 2,000,000 cubic yards for the reconstruction items. About 75% of this excavation would be suitable for power shovel or dragline operation. It is probable that the 1933 program will include 110 miles of paving to cost, including the grading, $5,600,000 and 65 miles of surfacing with gravel or crushed stone to cost $1,000,000. Massachusetts is carrying over into 1933 from 1932 about 1,000,000 cubic yards of excavation on existing contracts to cost $250,000.



Above: On the new Boston-Providence Road at Dedham, Massachusetts, Arute Brothers of Dedham, handle a hodgepodge of tough excavation with their Bucyrus-Erie 43-B clamshell, shown here loading to a Hug Roadbuilder. Right: Herbert W. Wright of Worcester uses this Gas+Air to build Massachusetts Highways.

Michigan

According to a statement by State Highway Commissioner Grover C. Dillman, surfacing for 1932 involves the following mileages:

20 Ft. concrete pavement	276 miles
Concrete pavement widening	81 miles
Concrete Recapping	34 miles
Gravel surfacing	123 miles
Asphalt surface on gravel	21 miles
Asphalt on concrete	1 mile
Bituminous Retread	12 miles
Gravel Resurface	180 miles
Waterbound macadam resurface	4 miles
Stamp sand resurface	12 miles

Carried over to 1933 are contracts involving approximately 65 miles of concrete pavement. The State Highway Department also will place approximately 25 miles of surfacing under contract within a very short time, which will be completed before July 1st, 1933. Beyond this the Highway Department is not making up any program of work before seeing just what Congress and the Michigan Legislature will do in the way of proving funds for new construction. In the event that no change is made in State funds, Mr. Dillman forecasts for 1933 a program that would total only about one-eighth of the annual program for several years past.

Minnesota

By wire, O. L. Kipp, Construction Engineer, gives the following summary of 1932 construction:

Paving	527	miles
Grading	570.8	miles
Bituminous treatment	862	miles
Plant-Mix Bituminous	30	miles
Graveling	664.1	miles

In addition 48 new bridges were built and 30 were widened.

Mississippi

The State Highway Department of Mississippi graded 43 miles of Federal Aid highway during 1932 at a cost of $215,000 and 6 miles of State Road at a cost of $16,000. About 900,000 cubic yards of excavation was involved. 35.3 miles were paved at a cost of $670,000 and 32.7 miles surface treated at $65,000. Light graveling on 103 miles cost $62,000.

Carried over into 1933 on old contracts is 2,000,000 cubic yards of excavation which will cost approximately $300,000. Included in this yardage is the work being done with the Emergency Federal Relief fund. Mississippi received $2,194,388 of Emergency Federal Relief for highways and this sum is matched by a like amount of Federal Aid. Aside from the work carried over from 1932 no forecast can be made for 1933. New work initiated will depend on funds made available by the legislature when it convenes.

Missouri

T. H. Cutler, Chief Engineer of the Missouri Highway Department, wires that up to December 10th Missouri has completed earth grading of 1675 miles, gravel surfacing of 1287 miles, concrete pavement on 323 miles and pavement in miscellaneous types of 44 miles.

For 1933 Missouri expects to build 1845 miles of earth grading, 1517 miles of gravel surfacing, 191 miles of oil mat, 87 miles of retread and 494 miles of concrete pavement.

It will be noted that the Missouri road building program will probably show a considerable increase during the coming year.

Out near Hastings, Nebraska, we catch this action picture on a township project. Contractor Harold Peterson of St. Paul built a mile a day with this Caterpillar Diesel and power elevating grader. To do this the outfit traveled at the rate of 2 miles in 40 minutes. The Diesel burned 30 gravity furnace oil which costs 5 cents a gallon. Thirty-five gallons ($1.75 worth) was all the machine required for a 10-hour day's work.

Montana

According to R. D. Rader, State Highway Engineer, total work placed under contract by the state of Montana Highway Commission during 1932, including estimate of lettings to be held December 15th, amounts to approximately $6,500,000. This includes mileage improved as follows:

Grading	511.849
Gravel Surfacing	611.636
Plant Mix Oiling	132.657
Road Mix Oiling	8.721
Bridges	2.245

Most of this work is financed with Emergency Federal Relief funds, matched with Federal Aid. Montana was allotted $2,525,000 of Emergency Federal Relief funds.

Practically all of the reconstruction, widening, etc., during 1932, is included in the above summary. The State oiled, by the penetration method, almost 400 miles of previously graveled highway, in addition to the construction shown in the above tabulation.

We do not have data as to the total amount of excavation involved in construction and reconstruction this year. About half of the road work allotted this year will be carried over into 1933.

It is expected that the December 15th letting will fully cover all Federal Relief funds available. Contract time limits on all of these projects have been so arranged that the work will be completed by July 1st, 1933, and all Federal Relief funds available will have been earned by contractors before that date. Montana did no paving during 1932.

Montana has not yet been able to sell the $1,500,000 Gasoline Tax Anticipation Debenture Issue authorized for 1932 and the 1933 highway construction program depends almost entirely upon this sale as well as the sale of a like amount of debentures authorized for 1933.

The Unemployment Relief Federal funds appropriated by the last session of Congress will match practically all of the Federal Aid funds available to Montana, by January 1, 1933. Therefore, the amount of Federal Aid available for next year's construction will depend entirely on appropriations made by Congress this winter.

The Highway Commission are preparing surveys and plans for a four or five million dollar program in 1933, anticipating the sale of the Gasoline Tax Debentures and the appropriation of usual Federal Aid funds. This would probably be divided as follows:

Road oiling	$1,000,000.
Bridges	1,000,000.
New Highway construction	$2,000,000. to $3,000,000.

Nebraska

During 1932 the Department of Public Works incurred obligations for highway work as follows:

Regular Federal Aid	$2,781,085.
Emergency Const. Highway Funds (Federal Aid)	2,544,773.
State Funds	2,500,928.
Other Funds	45,171.
Total	$7,871,958.

The work consisted of grading 45 miles of new Federal Aid Highway with an additional 163 miles made possible through the Emergency Federal Relief funds and 258 miles of state highways graded with state funds. There was also 210 miles of reconstruction, 46 miles of which was Federal Aid, 66 miles Emergency Federal Relief, and 98 miles state highway. The new roads involve about 7,000,000 cubic

(Continued on page 47)

Above, left: Gravel surfacing and aggregate are required in tremendous quantities for American road building. Here is a pit near Montevido, Minnesota, owned by the Murdock Construction Company. A Caterpillar Thirty and LaPlant-Choate scraper bring the gravel in to the portable conveyor that loads the trucks. An old truck stripped to the chassis furnishes the power for the conveyor. Above, right: Most highway work is done with shovels but there are times when a dragline is the best bet—S. J. Reader of Minneapolis carries convertible equipment to change this Bucyrus-Erie 32-B to shovel-dragline-crane or clamshell whenever the change means more economical operation. This is a Minnesota highway near McGregor. Below, left: Dirt moves fast on this job where Lundin Brothers of Mankato put their two Bucyrus-Erie 37-Bs to load wagons and trucks on a new piece of Minnesota Highway out of New London. Below, right: E. A. Young of Marble has been doing a good bit of Minnesota roadbuilding this past year. Here is a part of his outfit starting a borrow for shouldering material near Grand Rapids.

New Troy-Menands BRIDGE

Fitzgerald Brothers Construction Company, Inc. uses Gas+Airs to build approaches

THE CONTRACT for the approaches of the Troy-Menands bridge over the Hudson River was awarded by the Department of Public Works of New York State to the Fitzgerald Brothers Construction Company, Incorporated, Troy, New York, on April 5, 1932. The job consisted of an earth fill on each end of the bridge and a bituminous macadam pavement to be laid on the approaches. Also the building of five retaining walls in which there is upwards of 5,000 cubic yards of concrete, a concrete bridge 110 feet by 38 feet over the Wynantskill Creek, together with considerable underground duct work for the New York Power and Light Corporation.

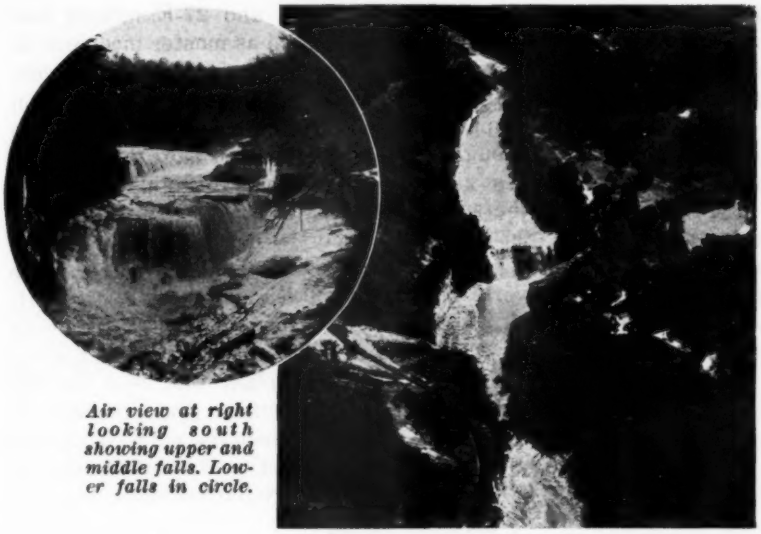
The fills, in the approaches, were about 55,000 cubic yards each. The excavating at the borrow pits was done with two Bucyrus-Erie Gas+Air shovels, the Troy end being borrowed adjacent to the Troy Airport and the Menands end from the top soil stripping at the Albany Gravel Company in North Albany. A third Bucyrus-Erie Gas+Air crane was used to elevate the concrete in buckets preparatory to placing it in the forms. A "Wiley" concrete bucket was used here.

Razed buildings furnish material for form work

On the Troy side, there were 28 buildings razed which included houses, stores and barns. Some of the material from these wrecked buildings was later used in the form work and all valuable material was salvaged. Also on the Troy side there is a bridge over the Wynantskill Creek that is being rebuilt to accommodate the new wider roadway. An interesting feature of this bridge job was the diverting of the stream by cofferdams, while placing the concrete for the abutments. A sewer system for drainage was built in both approaches including cast-iron pipe from 12 inch to 24 inches in diameter, and also 36 catch-basins and manholes. There are also two small buildings, one

(Continued on page 46)

1. Caterpillar Thirty bulldozing at fill on bridge approach. 2. Another fill with steam rollers doing the leveling. 3. On the Troy side showing razed buildings section. 4. Bridge over Wynantskill Creek rebuilt for new wider roadway. 5. The leveled and graded fill to widen the roadway and approach to the new bridge. 6. A battery of piles driven by a Bucyrus-Erie Gas+Air.



Air view at right looking south showing upper and middle falls. Lower falls in circle.

3-mile Section of Wolf Creek - Mt. Morris Highway through Letchworth Park opens new beauties to visitors

by **LLOYD S. GRAHAM**

Ingersoll & Barhite build interesting Park Highway

BUILDING a road through virgin country is somewhat unusual in the East but that is what Ingersoll & Barhite, general contractors at Medina, N. Y., did this year on their Letchworth Park job. This proved to be an interesting piece of scenic road construction. While it is only three miles long, its construction opened up a portion of the famous park which had hitherto been inaccessible to the public. This was the primary reason for its construction.

Letchworth Park consists of more than 7,000 acres, located on both banks of the Genesee River in western New York. Its southern terminus is at Portageville and its northern near Mt. Morris. It is at one point of a triangle the other two points of which are the cities of Buffalo and Rochester and whose sides are approximately 60 miles each in length.

Beautiful Portage Cascades rival famous waterfalls

While Letchworth Park is noted for its historic interest, it is most important for its scenic value, notably the three extraordinary cascades. These undoubtedly surpass in beauty anything of a similar character in the United States east of the Rocky Mountains with the possible exception of Niagara Falls. The three so-called Portage Falls on the Genesee are respectively seventy-one, one hundred and seven, and seventy feet in height. Cumberland Falls in Kentucky and Tahquamenon Falls in Michigan are about the only ones in the East, other than Niagara, which are comparable to these little-known Portage Falls.

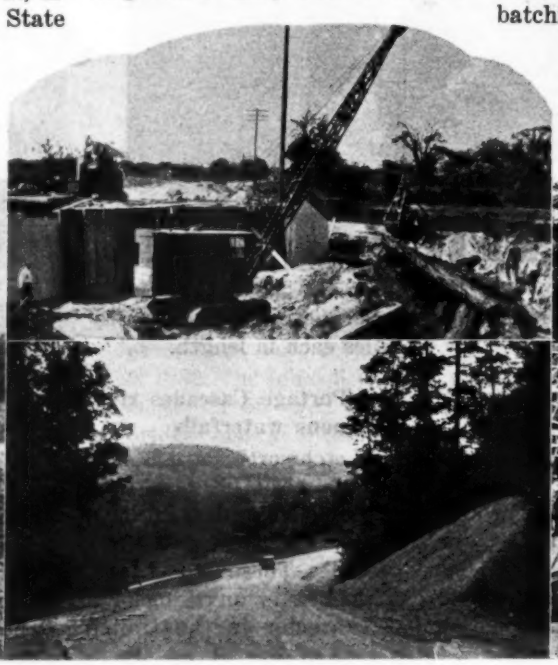
Dr. William Pryor Letchworth in 1907 gave his estate, which consisted of more than 1,000 acres, to New York State. This extended along the gorge of the Genesee from Portageville north. The state came into full control on Dr. Letchworth's death in 1910 and this was one of the first state parks. It was administered and developed for many years by the American Scenic and Historic Preservation Society. Gifts of land and purchases with state funds have increased the acreage and other purchases are projected which will complete the park at about 9,000 acres involving roads

Left: Before the work started . . . trees mark location of bridge. Center: Bridge under construction . . . Plant for pouring ring and spandiel walls. Right: After completion . . . Looking north over finished 110-foot bridge.

of scenic grandeur, and hundreds of camping places and more hundreds of picnic places. The Ingersoll & Barhite project alone provided parking areas for 325 automobiles.

For several years Letchworth Park has been under the direct control of New York State through the Genesee State Park Commission under the State Conservation Department. Wolcott J. Humphrey of Warsaw, N. Y., is chairman of the Genesee State Park Commission. Charles A. VanArsdale of Castile, N. Y., is executive secretary and R. W. How, engineer for the Commission. It was under the supervision of Mr. How that this road was constructed.

Using 1030 as a shovel.



Above: Clamshell work on bridge excavation. Below: A section of completed roadway.

Form work for bridge.

The completed road is known as section 1 of the Wolf Creek-Mt. Morris highway. This contract was obtained by Ingersoll & Barhite in the late summer of 1931. Both Charles A. Ingersoll and William Barhite were active in the supervision of the work. Francis White was job superintendent.

New road follows land contours to preserve natural beauty

All of the preparation for actual construction was done during the fall of 1931. Trees were cut down, stumps uprooted, underbrush cleared away, cuts made where required and fills made. This made it possible for the filled areas to settle during the winter months. No attempt was made to drive a road through in a straight line or upon a given level. Preservation of the scenic beauty along the right-of-way was one of the first considerations and, except for culverts over creeks and gullies as well as cutting down sharp declivities, the highway followed closely the contour of the land. Effort was definitely made also to avoid cutting or damaging trees unnecessarily.

Excavating totaled 55,000 yards

Altogether in the three-mile project there was excavation totaling about 55,000 yards. This amount was almost exactly sufficient for the necessary fills so there was little or no borrow. All of this work and considerable crane work was done by a 1030 Bucyrus-Erie three-quarter-yard shovel and a Universal crane and shovel mounted on a Mack truck. James Bloom operated the 1030 and Jack Hall, the Universal. Nelson Davis was in charge of the Rex 21-E and 27-E mixers and also served as master mechanic in charge of equipment on the job.

The road is of the emulsion type bituminous macadam, the emulsion work being handled by the American Bitumuls Company. The parking loops were finished merely with a gravel surface. A Warco and a Weir grader were used. Two rollers—a ten-ton Buffalo-Springfield and a five-ton Acme—were used. A Blaw-Knox batching plant was used for the extensive concrete work on three large culverts as well as several smaller ones. A large Barnes road pump was used as well as several smaller ones in connection with power drainage at the various points during construction. A Keystone skimmer, operated by Frank Coon, was also used considerably. Seven Ford trucks were operated in the Ingersoll & Barhite outfit but all of the heavy trucking was done by thirteen Macks, owned and operated by Fred D. Langdon, who, among other things, hauled the aggregate from Leroy, a distance of 24 miles. The sand, cement and steel were brought in by rail.

The right-of-way was extremely precipitous in places, necessitating a few deep fills. The excavating was in a mixture of earth,

Truck haul was used.

including gravel, and some very hard blue clay or hard-pan and shale. The hard-pan certainly tested the stamina of the 1030 but almost no blasting was necessary so successful were they in breaking down the cuts with the shovels.

Bridge of 110-foot span presents difficulties

The most difficult piece of work was in the construction of the larger of the three bridges. Besides the bridges there were 37 culverts in the 3 miles. The largest bridge has 110-foot span with approaches of 220 feet. It is a simple arch type with the arch 80 feet in the clear above the surface of the stream below. Luckily there was very little water in the stream at the time of construction. The bed of it was also of solid rock as well as the haunches for the bridge at the sides.

The most difficult and painstaking part of this bridge work was the erection of the false structure for the arch. This had to be built up with timbers from the stream-bed and the rocky sides. About 50,000 feet of lumber were used in this substructure, including 172 fourteen-foot logs. A few of the logs were cut from the right-of-way but most of this lumber had to be shipped in. They were placed by the Bucyrus - Erie and Universal cranes. One of the cranes had to be moved a distance of four and one-half miles to reach the point of operation 110 feet across the gorge. At times in moving it, the earth was so precipitous that progress was only possible with four trucks ahead pulling and two in the rear pushing.

Good teamwork speeds up the job

The contractors spoke in considerable admiration of the splendid teamwork of the crane operators who placed the timbers in the gorge, a line from each crane being attached to each timber, one operator paying out while another took in—a sort of a give-and-take stunt — in which these men attained great skill. They reached what they believe to be a record with the placing of 56 fourteen-foot logs, 18 inches through at the butts, in position in the gorge in just 56 minutes. The entire operation was completed without accident, except those of the most minor nature. Great care was taken to prevent accidents, both in placing this false structure and in removing it. The bridges were made of reinforced concrete, 130,000 pounds of reinforcing steel being used in the two largest bridges. Both bridges and all concrete work were finished with a trim of nine inches of local limestone, quarried on the park property, and finished in the rough so that no concrete is exposed to view. This was placed after the bridge itself was entirely completed and the concrete hard.

Tracks from the mixing plant were built out over the ring of the falsework and from these tracks, cars dumped concrete into forms as required. A finished surface of roadway, 20 feet in width, was provided throughout the project. The second bridge is almost a duplicate in miniature of the first. It is a span of 55 feet with a height in the clear to the gorge of 30 feet.

The 1030 Bucyrus-Erie showed great flexibility in use on this job. It was not only used for excavating in the cuts, but it was also used in the quarry and gravel pit. It was invaluable in its use as a crane on the bridge projects. It was used with a clam for providing drainage and was also used in placing drainage pipes.

This work was completed by Ingersoll & Barhite in July, 1932.

Airplane view looking west showing parkway. The river flows northeast (toward the right). The work in the contract is shown between the two arrows. Road in lower left is a county road on east side of river in Livingston County.

The truck that was swallowed up . . .

by **J. N. STANTON**

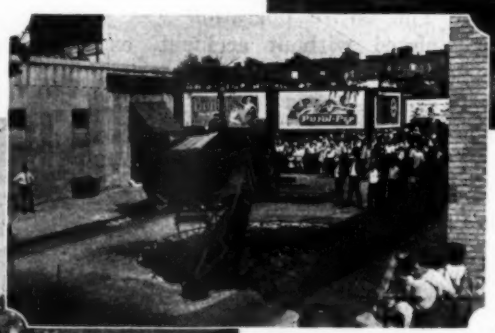
BEING the strange saga of a 3½-ton delivery truck which, after the terrain had opened its maw, plunged down thirty-five feet, carrying with it **two thousand quarts of ice cream,** severing electric and telephone cables, tearing through an eight-inch water main and puncturing the brick casing of an 18-foot sewer pipe. And as if this wasn't bad enough, Mr. Truck repeated the precise operation on the following day!

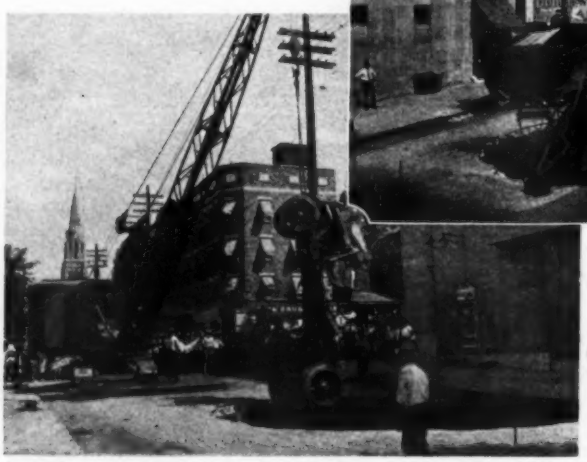
The freak accident occurred in Philadelphia, at 43rd and Walnut Streets, on August 29th, 1932. It seems that the driver was proceeding north on 43rd Street when the vehicle's right rear wheel sank into a small hole in the paving. He got out of the car, gave a look at the wheel and then stepped quietly to the sidewalk and entered a near-by phone booth. While he was in the act of telephoning for a towing car, he heard a rumbling sound and glancing sideways got a flashing glimpse of his truck as it disappeared from view like a shooting star.

Next day a huge crane, tractor tread, lumbered to the scene. And while one thousand persons looked on, workmen made the necessary hookup and proceeded to raise the truck from the pit. Unfortunately the crane's motor stalled just as the truck was about to be swung clear. The crane overturned, the boom crashed across the hole and the chassis, from which the body had been torn loose, plunged downward again with a reverberating rumble terminating with a thud that could be felt throughout a large area; and once more water, gas, telephone and electric service, which in the meantime had been repaired, was interrupted when mains and conduits were ripped asunder.

On the night of the 31st of August more paving at this point caved in without warning and only several hours following the second and successful attempt to salvage the truck. The opening now reached from curb to curb, where the sidewalks had cracked and sagged, as also had several buildings on both sides of the street.

The city's blueprints on file at the City Hall offer a very definite explanation for this surface let-down. They reveal that quite a number of years ago there was a huge stone quarry at this point and that consequently the street above and sidewalks and buildings on the spot have occupied a position on filled-in ground.





Above: Workmen shoring up buildings with timbers at the 43rd and Walnut Street cave-in.

Center: As the crane collapsed, the truck crashed back into the hole for the second time through newly repaired electric, gas, telephone and water conduits.

Left: The truck was in this position on the first time out when the crane engine stalled and crane tipped.

Redwood Empire Barrier Broken by Granfield, Farrar & Carlin

Difficult California highway project saves tourists time, eliminates dangerous curves, grades and fog hazard

by **GORDON W. MONFORT**

WHILE thousands of week-enders, vacationists, sportsmen, tourists and through travelers applaud, Granfield, Farrar and Carlin's battery of earthmoving equipment is busy breaking one of the oldest barriers to rapid, safe auto travel into California's Redwood Empire.

The 17-mile section of Redwood Highway between Cloverdale and Hopland has long been a barrier to fast travel into the Redwood Empire. Heavy grades, poor alignment and sharp curves added to the difficulties of dense fogs during the winter have made the road exceedingly dangerous for present speeds and heavy traffic.

The State Department of Public Works began the good work by laying out and purchasing a new right-of-way along the Russian River. This route is three miles shorter than the old, reduces the number of curves from 276 to 49 with a minimum radius of 1000 feet, is below the fog line, will reduce the length and percentage of grades and halve the driving time between Cloverdale and Hopland.

With all its advantages, the new route presents many difficult problems for both engineer and contractor. Following the line of the river, much care must be given to provide protection against river washes. Rock retaining walls built of boulders found in the river bed take care of this problem. The boulders were placed by derrick in neat lines on excavated foundation. The wall slope is 1 to 1.

Slides a problem

The new alignment runs through what is generally considered one of the most active slide sections of the country. The geological formation is volcanic. A lava flow is superimposed over bed rock. This porous volcanic material is subject to slippage when saturated with water, but the danger is largely eliminated by providing proper drainage for natural impounding areas above the cuts through culverts and run-off ditches. These impounding areas heretofore acted as reservoirs which held the water, allowing it to seep into and saturate the volcanic material. Slides then became imminent and were a constant menace on the old road during wet winters.

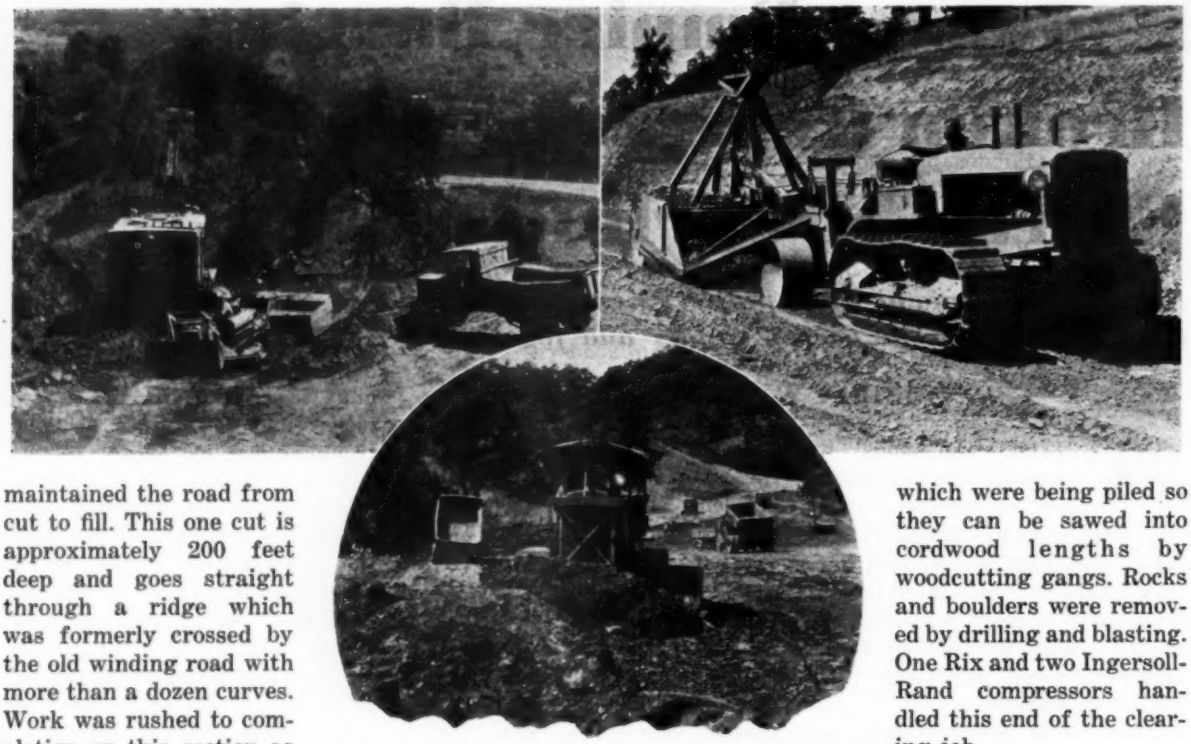
The location of the railroad on the opposite bank of the river necessitates the construction of two grade separation structures. Several other structures must be built to cross the river in two places and to bridge the most troublesome slide area.

Granfield, Farrar & Carlin, San Francisco contractors, were awarded initial contract for clearing and grading. The State Department of Public Works will construct the six major structures, while minor structures, culverts and drainage ditches, are being taken care of in the grading contract. The contract price is approximately $465,000 and 400 working days are allowed for completion.

One cut 200 feet deep

Work is now well under way. The contractors tackled the toughest spots first. One complete outfit tore out a deep cut at the rate of 240 yards an hour. Two Bucyrus-Eries, one 43-B and one steamer, fed 16 trucks that averaged five round trips per hour on a 400-yard haul. A "Caterpillar" Sixty mounted with a bulldozer spread the dumps and a Thirty

◆ *Working the deep cut at the Cloverdale end of the job two Bucyrus-Eries kept 16 trucks hustling.*



Left: A Caterpillar "30" maintained the road from shovels to fill. Right: Here's a LeTourneau scraper with an Allis-Chalmers Model "L" on the Cloverdale-Hopland job. Above: A Caterpillar Sixty with a bulldozer keeping the dump level for 16 trucks making an average of five trips each per hour.

maintained the road from cut to fill. This one cut is approximately 200 feet deep and goes straight through a ridge which was formerly crossed by the old winding road with more than a dozen curves. Work was rushed to completion on this section as it is the only place along the right-of-way where construction work interfered with travel on the old road. This section was completed before the heavy summer flow of traffic began.

Two other crews were also at work excavating cuts. One Thew-Lorain 1¼-yard shovel dug into extremely soft turf, cutting the right-of-way out of the riverbank midway of the contract. Much difficulty was experienced with slides on this section and the shovel made no attempt to cut very accurately to the slope. The work of bank sloping was done by hand, the men in many places being suspended from above by ropes so loose and sliding was the bank material.

Payton Brothers, also of San Francisco, sub-contracted on another section of heavy cuts at the north or Hopland end of the project. They used the tractor scraper method as the soil was ideally suited to it. Much of the material was so soft that scarifying is unnecessary. Two Allis-Chalmers tractors pulling 7-yard LeTourneau and Sager scrapers worked in one group, while five "Caterpillars" did the scarifying, clearing out and pulled 7-yard scrapers to make cuts in another section of the route.

Cleared timber makes cordwood

"Caterpillar" tractors performed the major work of clearing the right-of-way of trees and brush, which were being piled so they can be sawed into cordwood lengths by woodcutting gangs. Rocks and boulders were removed by drilling and blasting. One Rix and two Ingersoll-Rand compressors handled this end of the clearing job.

The new road traverses a section of unusual mountain beauty with river vistas that should be a constant source of delight to travelers. The State has purchased the right-of-way down to and including the river frontage wherever possible to use as public park, picnic and camping areas.

Truly, the road is a triumph of engineering and contracting genius. Well-trained personnel and efficient equipment are defeating some of the worst conditions in the country to meet the popular demand for more speed with greater safety.

THE STEAM SHOVEL

By Ellen Garnett

Courtesy Richmond Magazine

Out past the city's fringes, where the refuse dumps begin,
Through burning ghats and ash strewn flats, I bring my alien din.
I drag my clumsy carcass, I crunch and creak and creep
To walls of clay that block men's way, rock ribbed and torn and steep.

I halt at the grim embankment; I shriek for my Juggernaut priest;
He stokes my maw, while my huge iron jaw bangs loose for the coming feast.
A blast from my sooty siren, I swing with a rhythmic thud,
And sink my teeth in the ground beneath, for my meal of mire and mud.

I gorge on grit and gravel, and spew it to trucks and drays,
As I do the job, a blue-print mob stakes out the trail I blaze.
Men called them the "hills everlasting;" that were before my birth.
I mow them down to build a town—I'm Progress rebuilding the earth.

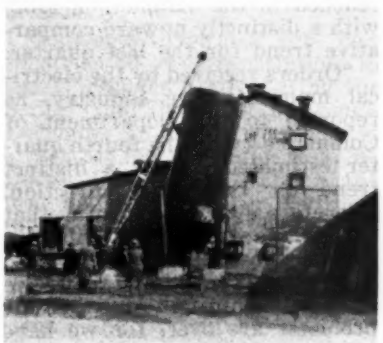
FIELD NOTES

Profits in Pick-up Jobs

THE ENTERPRISING contractor can frequently find opportunities to use his equipment to good advantage and profit on jobs that would not ordinarily come his way. The better he is known in his community the more opportunities he gets for these fill-in jobs. Even then many of them must be deliberately hunted for.

Here is one that proved profitable for William Barhite of Medina, New York.

A western New York insecticide manufacturer was faced with the peculiar problem of erecting two tanks for arsenic solutions. Each tank weighed eight tons and had to be placed,



complete upon a steel base. Mr. Barhite secured the job and solved the problem with his Bucyrus-Erie 1030 operating as a crane. The operation, as illustrated proved very simple and the entire job was completed in a few hours—*Loyd S. Graham.*

Object Lesson in Contracting

"EXPECT and guard against the unexpected." There can be no safer motto for the excavation contractor when he is about to enter into an agreement to perform a job on a site subsoil conditions of which are not thoroughly known.

Witness the loss sustained by a contractor in a case lately decided by the Louisiana Supreme Court (Jung v. Gwin, 139 So. 774).

He undertook construction of a building, involving excavation for a foundation. Flow of quicksand caused considerable delay and damage. Question arose as to who must stand the resulting loss. The parties failing to agree, there was an arbitration. The arbitrators decided in favor of the contractor. The owners appealed. The contractor threatened to abandon the job if the award were not paid. Payment was made under protest, and suit brought to recover the amount paid. The Supreme Court decided that the award was improper and that it was paid by the owners under such coercion as entitled them to recover the amount paid.

As to the merits of the controversy, the court said:

"The flow of quicksand, cause of the damages and delay which were the subject of controversy between the parties, was due to the single fact that the sheet piling, driven to provide lateral support for the soil adjacent to the excavation that was being made for the foundation, was not of sufficient length for the purpose; and the question is, Whose was the fault, if any; and, if there was no fault, then whose was the risk?

"We see no fault on either side. Both the contractor and the architects are acknowledgedly men of skill and experience in their respective callings, and neither of them expected, or had reason to suspect, the unusual soil conditions which afterwards developed. Had the architects expected, or even suspected, such condition, they would undoubtedly have provided, in order to insure the safety of the work under their supervision, for a greater minimum length for the aforesaid sheet piling. And, by the same token, had the contractor expected or suspected such condition, he would not have failed to use sheet piling somewhat longer than the minimum which contract and specifications required him to use. . . .

"It is the general rule that the risk of all such unforeseen, though preventable, ocurrences fall on the contractor, unless the contrary be clearly agreed upon.

"And in this contract it was not so agreed. On the contrary, the contract very definitely provides, especially in the matter of sheet piling, that the contractor shall beware such conditions."

—*A. L. H. Street, Attorney-at-Law.*

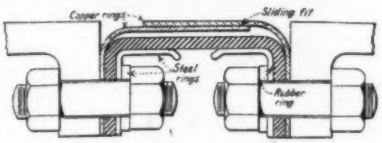
Ingenious Arrangement of Hooks at Ends of Double Drop Chains Speeds Handling of Pipe

THE Indian Territory Illuminating Oil Company of Oklahoma City uses the above Bucyrus-Erie crane to speed up the handling and loading of pipe in their pipe yard. The arrangement of the two hooks at the end of each hook chain beneath the spreader permits easy handling of two lines of pipe at once.

—*Betty Hudson Smith*

Home-Made Water-Tight Expansion Joint

ENGINEERS and contractors will doubtless be interested in this home-made expansion joint designed by a large Eastern engineering concern. It was designed in order to solve an expansion joint trouble. The joint was made leak-proof by means of a rubber ring, as plainly shown in the accompanying sketch. The



joint is strong laterally because of the two telescoping copper rings which makes it possible for the joint to withstand considerable pressure. A joint of this kind is excellent for handling water and other fluids that will not attack the rubber. It cannot be used for high-temperature steam or water, as the rubber deteriorates under excessive heat. Nor can it be used for handling oil because rubber dissolves in oil.

—*W. F. Schaphorst, M.E.*

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The Business Situation

THE record of the past three years does not show a steady decline in business activity, but a decline repeatedly interrupted by rises in the curve, which were at the time erroneously taken to mean that the final upturn had taken place. During the gradual increase in business activity which will bring back prosperity —during the rise of the curve— we will unquestionably encounter a number of horizontal movements and we will probably encounter a number of set-backs, no one of which will mean that the increase in business activity has been more than temporarily halted.

Many data for the year 1932 indicate that we are now on the way up. As this is written we are experiencing a halt in the increase of business activity. This temporary change in trend was not unexpected but was aggravated in no small measure by the problem of foreign debt payments, a matter which does present a serious problem but certainly not an insurmountable one. This change in the progress of the curve has produced a wave of pessimism among business men closely analogous to the wave of optimism which the country experienced when in the early summer of 1930 the curve turned temporarily upward. No amount of statistical study will prevent these mental reactions to our temporary halts in progress but we must bear in mind that just as optimism ruled our minds in the fall of 1929—to such an extent that we could not forsee a depression statistical records showed that we were bound to have as a result of the World War — just so at the bottom of this depression we are unable to give full credence to the signs which indicate fundamental improvement.

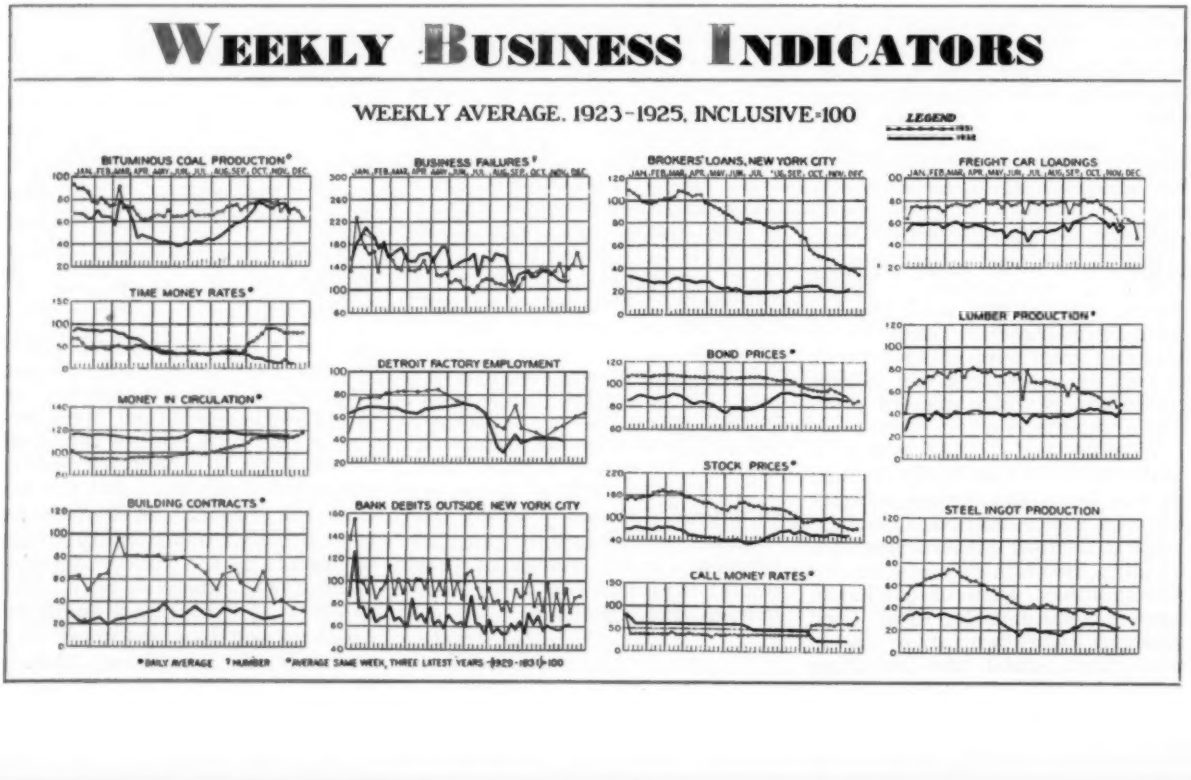
As decidedly interesting in the study of trends we quote the following from a statement by Gerard Swope: "Possibly the best basis for trying to judge the immediate future is the recent tendencies of the past. For that purpose I know of no better index than the use of electricity throughout the United States. This index is the quicket reflection of business activity because when a manufacturer gets an order he starts a motor to run his machinery and turn out the order, and in the household the increased use of light and appliances may be a reflection of a little more employment or, at all events, better psychology. The accompanying chart shows the percentage relation of each quarter this year with the same quarter of 1931 and indicates there was a decrease in the use of electricity in each quarter compared with 1931, but distinct improvement in the last quarter.

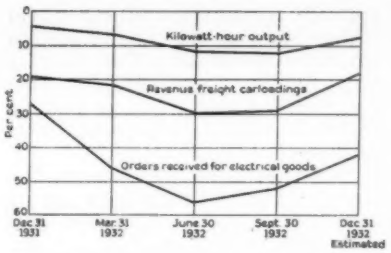
"Another excellent index of business activities is freight carloadings. When an order is completed and shipped, it is immediately reflected in carloadings. Here the curve is very similar, showing that the low point was reached in the summer of 1932, with a distinctly upward comparative trend for the last quarter.

"Orders received by the electrical manufacturing industry, as reported to the Department of Commerce (with the fourth quarter estimated), show a distinct trend in the same direction. Therefore, we are hopeful that this comparative trend will continue upwards."

By our paragraphs above we are not attempting to say that our problems are over, for we have

WEEKLY BUSINESS INDICATORS





Per Cent Decrease Each Quarter from Same Quarter Previous Year

many a problem of government to solve before we can reach prosperity. The most important of these problems are probably the balancing of the Federal budget, the settlement of war debts, our tariff policy, and the maintenance of sound money. The last appears to have been adequately taken care of as is suggested by the return flow of gold to our country. The only danger is that of an attempt to deflate the dollar value artificially.

Contracts awarded for new construction of all descriptions in the 37 Eastern States during the period from December 1 through December 15, 1932, were valued at $42,146,600 according to F. W. Dodge Corporation. During the first half of November contracts in this area showed a valuation of $50,990,300.

The November contract record for construction of all descriptions made a creditable showing. Though the month's total of $105,302,300 for the 37 Eastern States represented a decline of something more than $2,000,000 from the October total, reduced to a daily average basis there was an increase in November as contrasted with the longer month which preceded it. As a matter of fact if full allowance is given to seasonal factors the November record was sizably better than that shown for October. In addition November showed an actual gain over October of about 1,000,000 square feet in the amount of new floor space involved in the contract record; this, too, is contrary to the usual seasonal condition between the two months.

November awards for residential building totaled $19,245,300 as against $21,855,600 in October and $45,290,400 for November, 1931. For the elapsed eleven months of 1932 this class of building showed a contract volume of $267,110,400 as contrasted with a total of $775,225,200 for the corresponding eleven months of 1931. Thus the November decline from a year ago of about 58 per cent is measurably smaller than the cumulative decline for 1932 of almost 66 per cent.

Non-residential building contracts let during November totaled $31,844,800 as against $27,117,400 in October and $57,871,500 in November of last year. For the elapsed period of 1932 this class of construction showed a contract total of $455,844,700 as against $1,060,133,300 for the corresponding eleven months of 1931. Here, too, examination of the November record discloses that the current decline in contrast with the cumulative loss has been sizably reduced.

November contracts for public works aggregated $50,095,900 as against $50,236,800 in October and $38,799,000 in November, 1931. This is the only major classification of construction to show a gain over the same month of 1931. Against this comparison is the total for the elapsed period of 1932 of $477,833,500 as compared with $835,939,600 for the corresponding months of 1931.

Public utilities undertakings in November totaled $4,116,300 as compared with $8,264,100 in October and $9,235,000 in November of last year. For the first eleven months of 1932 this class of work showed a contract volume of $69,150,800 as against a total of $284,699,800 for the corresponding eleven months of 1931.

Gains in construction of all types for November as contrasted with October were reported for the Pittsburgh, Southeast, Central Northwest, Southern Michigan, St. Louis, and New Orleans territories; the remaining seven territories east of the Rocky Mountains showed declines. Gains over November, 1931, were reported in the Southeast, St. Louis, Kansas City and New Orleans districts.

Digging a Road Through Rock!

THE CHARLES HARLOWE, JR. contract for grading a road from Pain Flat to Mariposa, California, runs directly through the "Days of '49" country . . . through the site of the old city of Carson Flat, whose population at one time reached 5000, now barely a mark to prove its existence. Here and there are a few piles of abode bricks which mark the sidewalks of some miner's shack, long since abandoned and overgrown.

The Carson Cutoff is 15 miles long . . . making a saving of 2.0 miles over the present highway. The work being done as this is written, is on the last half of the 15 miles, the first half being graded and in use. After the entire project is finished it will probably be surfaced with an oil mix.

The work is being carried on at three different points along the line — at Mariposa a concrete bridge is being finished — at another point tractors and scrapers are cutting and filling—but, here, near Carson Flat, where the going is really tough, it takes a Bucyrus-Erie 37-B shovel to get the road to grade. The cut shown is about three times as deep as the shovel is high. Altogether there will be 250,000 yards moved!

Old Times & Old Timers

OLD TIMER W. C. McGinnis has suggested that we make our Old Timer's section which has been running the past few months a permanent column for the exchange of anecdotes, adventures, and interesting machine data regarding old times and old timers. So many readers have expressed interest in the recent letters that we are going to follow Mr. McGinnis' suggestion and try to give you each month one or two yarns of the old days.

Old Timers . . . the "makings" must come from you. We will pay for all published letters. They should not be more than 500 words. Write in your own words and your own way. Tell the most interesting experience in your excavating experience. We want facts and facts only. The events must have occurred at least fifteen years ago. If possible send pictures along with your letter . . . pictures of old timers connected with your story and the machines they worked on . . . the older and odder the better. Any pictures submitted will be returned promptly . . . please wrap and protect with cardboard when you send them to us, however, as we cannot be responsible for damage in the mail.

Let's go . . . Old Timers! Cash for your yarns and pictures . . . fun for all of us old timers and youngsters.

Here's our start . . . from

OLD TIMER *J. F. Sullivan*

"I have noticed in your last two issues," says Mr. Sullivan of St. Louis, "articles on the Rood Excavator which brought to my mind two shovels I have seen, one operated by me.

"About the year of 1922 I was employed on the Pan-American Petroleum and Transport Company aboard an oil tanker as second assistant engineer plying between Tampico, Mexico and various world ports. One night while loading a cargo of crue oil in Tampico the radio operator and I slipped ashore while the ship was under quarantine for yellow fever to get a few shots of that famous Mexican Tequila. Sparks made it back aboard the ship O.K. But the next morning I awoke in a large field minus my shoes and sixty pesos, the ship having been released and cleared for Rio without me early that morning.

"Staked for a drink and a pair of peon sandles by the good-hearted bartender that had me robbed, I proceeded to the City of Tampico across the Panico River to secure aid from the American Consul. But I was informed there that the American Government had made no provisions with his office to aid beach combers.

"I proceeded back across the Panico River for Corona and my bartender friend who advised me that considerable construction work was going on at the Huastica Refinery. There I could probably secure employment as the Gringo was in demand, especially those with a trade. At Huastica I ran across an old Bucyrus 14-B traction wheel steam shovel trying to dig with a "Spick" operator. After a brief conversation with Ray Kemper, Chief Engineer of Construction, I sold him on the idea of my operating this machine as I had operated a 28 Marion steam shovel, a new 45 Bucyrus standard and a Marion Bank speed friction dipper dredge.

"This 14-B had channel iron dipper sticks without any deadwood in them. The swing engine throttle operated with the feet while the crowd and hoisting throttles were overhead and a hand friction clutch was also used as brake. After a day of getting the feel of this rig we started to load dirt.

"On this same job in the junk yard was an old standard shovel mounted on railroad trucks. This rig carried a manufacturers name plate "Kelgore." As well as I can recall this machine had a long stroke piston crowd on the saw mill shot gun feed system. I have seen shovels in the far north and the tropical south but have never seen or heard of this type of shovel outside of the one in Tampico. I would be interested in some history on this type rig.

"Did Bucyrus build many 14-B's like the one in Tampico? I later ran across a 14-B in California but this machine was improved over the one in Tampico.

"I have been employed on shovels of various makes and motive power, the last being a Bucyrus-Erie Gas+Air. What an improvement this Gas+Air over the 14-B."

Georgette: "When did they first get the idea of using buses for transportation?"

George: "When Brigham Young went on his honeymoon."

MORE QUESTIONS

? *for* Old Timers *by* Old Timers

? QUESTIONS and information printed in the Excavating Engineer during the past few months has lead to some very interesting further questions. Here are some questions to which many an old timer will know the answer. Send along your letters, we will be more than interested to hear from you.

? 1. Back in the old days Mathews Bros. of Erie, Illinois, owned a Cross back-digger which operated in both Whiteside County, Illinois and in several towns in Iowa—Lake Park, Spirit Lake, Fonda, Algona, Superior, Pocahontas, Sibley, Spencer, Wooden and Titonka. Both Mr. Mathews and Ed Lovejoy operated this machine. If you know of any other men who operated this machine send us their names. If you know of any other men who also worked on the jobs at these towns, let us have the story.

? 2. Who has a copy of the old Cross Catalog? If you have one please tell us about it. If you did have one tell us when you received it.

? 3. It is some 25 years ago that George A. Castle of Crookston, Minnesota used a Fairbanks back-digger with a two line control on some work in Montana. If you saw this machine work or know of people who did, let us hear from you.

?

EQUIPMENT
You Ought to Know About

New Hydraulic Snow Plows by LaPlant-Choate

THE completion of a new series of hydraulic operated snow plows for use on the "Caterpillar" 25-35-50-65 and Diesel tractors has been announced by the LaPlant-Choate Manufacturing Company, Inc., of Cedar Rapids, Iowa. These plows include new and improved features, among which is the newly designed wing hoist, which provides greater facilities for pushing out side banks of

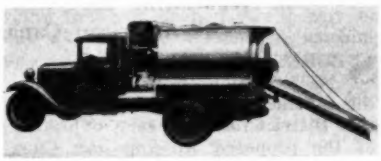
snow. The wing is lifted simultaneously at three points, at the front,—at the rear and at the point on the tractor where the wing braces are attached. Thus the chances of its folding up are entirely eliminated, as the wing brace tubes are perpendicular at all times.

The "V" nose and wings are raised and lowered by means of hydraulic pressure, obtained from the tractor power take-off. The control levers are placed within the cab convenient to the tractor operator's seat. When writing the manufacturer for further information, please mention Excavating Engineer.

Blaw-Knox Improves Line of Truckmixers

A NEW line of improved Truckmixers and Agitators has recently been announced by *Blaw-Knox Company, Blawnox, Pennsylvania.* This new line has been designed from the viewpoint of obtaining the lowest possible maintenance cost together with long life. Strength has been provided without excessive weight for aluminum alloy castings have been used wherever feasible to reduce weight to a minimum.

Separate power units consisting of 4 and 6 cylinder gasoline engines, depending upon the size of the Trukmixer, are utilized. The mixing efficiency of this improved Blaw-Knox product is derived through a unique arrangement of mixing blades which are



also claimed to facilitate quick discharge. In the entire line, three point suspension has been provided for the drum. Two points of suspension are at the rear censisting of a high carbon steel tire welded to the drum, and riding on two double flanged rollers supported in a cross-saddle. The front suspension consists of a structural pedestal supported on the mixer sub-chassis. Thus the support of the drum is self-aligned in every direction. Electric welding has been used throughout.

Other features include dual controls for operation, gravity feed, water tank and the special Blaw-Knox transmission. For complete information and specifications write the manufacturer, mentioning this magazine.

New Series Brookville Locomotives

THE NEW "B-I-30" series of industrial locomotives has recently been announced by Brookville Locomotive Company. Supplied standard in all gauges, in 4, 5, 6 and 7-ton weights, these locomotives are strictly a quality product to sell at the lowest possible price. Speed range, both forward and reverse, from 2 to 15 miles per hour, with engine power far above the average used

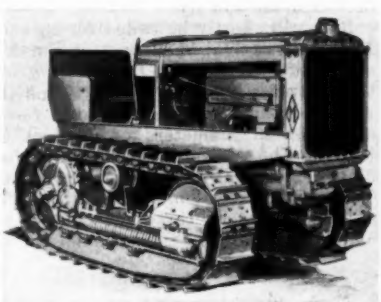
in locomotives of this weight.

The power unit is the new "I-30" McCormick-Deering industrial tractor, especially designed and manufactured by the International Harvester Co. Locomotive features include a heavy unbreakable steel frame, sanders, dual brakes, dual spring journal boxes, etc. For further information write *Brookville Locomotive Company, Brookville, Pa.,* mentioning this magazine.

The New Allis-Chalmers Model "M"

THE latest addition to the A-C line of track-type tractors is the Model "M" to sell for a low price. It represents years of research and engineering in the industrial and agricultural tractor field. It has been tested in every conceivable way and has demonstrated its ability to stand up under hard continuous work.

The Model "M" follows the general design of the A-C Model "35" and Model "L," tractors that have



met with decided approval throughout the country. This new achievement of Allis-Chalmers is modern in every feature. It possesses four speeds forward, renewable cylinder sleeves, unit construction, steering clutch control and many other points of superiority. Ample power is furnished by a modern engine that will deliver approximately 28 drawbar horsepower. The Model "M" weighs 6,200 pounds and the track shoes are 12" in width.

The wide variation of speeds, 2.23 to 5.82 miles per hour greatly increases this tractor's range of usefulness. The ability of this machine to work at high speed in loose or wet soil and its ease of handling in close quarters makes it an ideal tractor for field, farm, forest, or factory.

For complete specifications write the *Allis-Chalmers Mfg. Co., Industrial Tractors Div., Milwaukee, Wis.* Please mention this magazine.

. (Continued on page 42)

SHOTS from the Firing Line

Two Important Western Lettings Soon

By H. L. LIVINGSTON

BIDS WILL be received until 2:00 P. M. February 2, 1933 by the San Francisco-Oakland Bay Bridge for contract No. 2 for the substructure between San Francisco and Yerba Buena Island. The opening of these bids will mark the beginning of the San Francisco-Oakland bridge, which will connect the two cities. This work involves four piers, central anchorage and alterations to harbor pier No. 24. Plans and specifications may be obtained either at 500 Sansome Street, San Francisco, or from Moran & Proctor, 120 East 41st Street, New York City. Charles H. Purcell, Chief Engineer of the California Highway Commission, is also chief engineer of this project. Additional bids covering this project will be called for shortly.

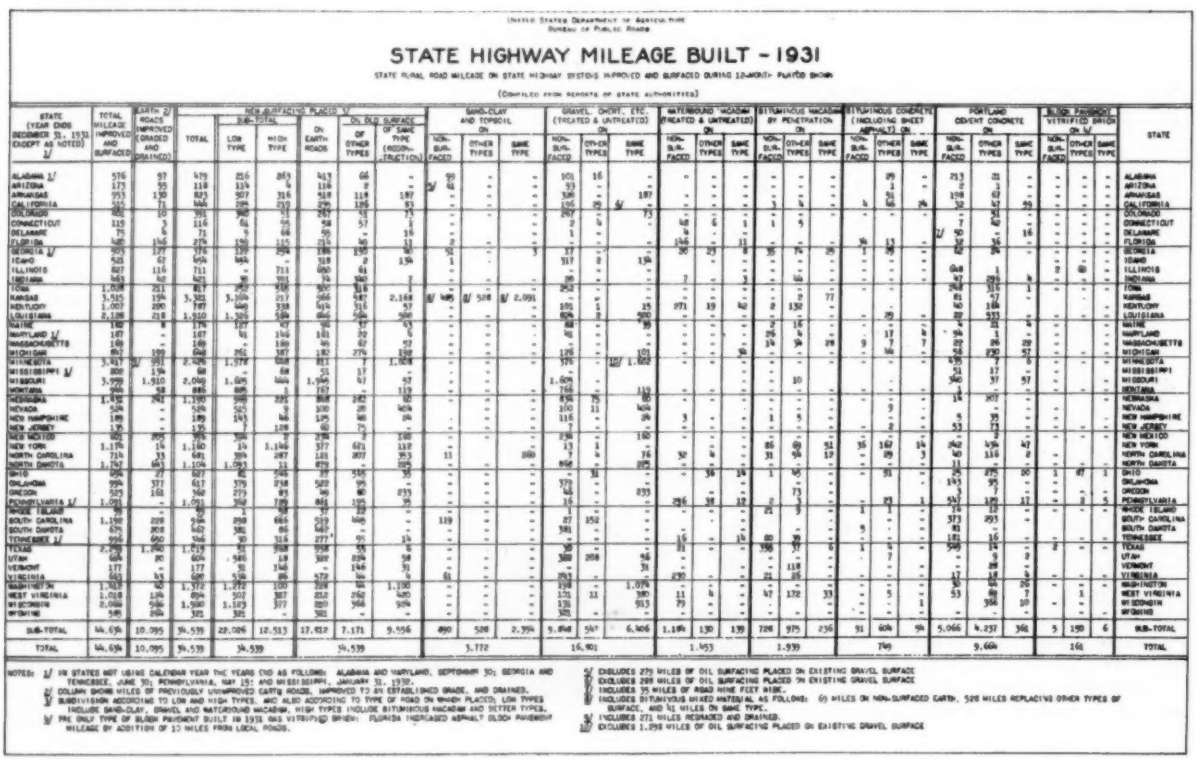
Bids will shortly be called for by the Metropolitan Water District of Southern California for the construction of the Valverde and Bernasconi Tunnels with a combined length of 43,000 feet, and internal diameters of 15 feet 3 inches. The Valverde Tunnel will be 37,140 feet long and the Bernasconi Tunnel 5,920 feet long. Bids will probably be called on three schedules — 1. Valverde and Bernasconi Tunnels as a single project. 2. Valverde Tunnel as a separate project. 3. Bernasconi Tunnel as a separate project.

Another Step Completed in Negotiating the All-American Canal

SECRETARY WILBUR announced his execution on December 3rd of the contract with the Imperial Irrigation District for repayment of the cost of the proposed All-American Canal. This brings this project one step closer although further negotiations are necessary before it will be submitted to Congress with a request for an initial appropriation for commencing construction. The Department of Interior contract was negotiated in Washington by representatives of the Department, the Imperial Irrigation District and the Coachella Valley County Water District. Participating in the conferences in behalf of the Department were Dr. Elwood Mead, Commissioner of Reclamation, Northcutt Ely and Charles A. Dobbel, Assistants to the Secretary, E. C. Finney, Solicitor, Porter W. Dent, Chief Counsel for the Reclamation Bureau, and R. J. Coffey, District Counsel for the Bureau of Reclamation in Los Angeles. The Imperial Irrigation District was represented by Messrs. Mark Rose and John DuBois of The Board of Directors, Charles L. Childers, Counsel and M. J. Dowd, Chief Engineer. The Coachella Valley interests were represented by Dr. Harry W. Forbes, and Dr. S. S. M. Jennings, of the Board of Directors, and Attorney Arvin B. Shaw, Jr.

The contract provides for unification of the lands to be served, by inclusion in the Imperial Irrigation District. It incorporates, however, a number of provisions especially requested by the Coachella Valley interests, including arrangements by which the present Coachella District will retain its corporate entity and certain financial functions. It represents a compromise of the previously conflicting views of the Imperial and Coachella interests.

The canal is estimated to cost about $38,500,000 and will carry water from the Colorado River to the Imperial and Coachella Valleys. This contract will not become effective until certain proceedings are concluded in California, including an election within the Imperial Irrigation District, followed by the usual validation decree. When those proceedings are completed and the contract goes into effect it is planned to request an initial appropriation of Congress for commencing construction. The work will require several years and will employ several hundred men.



UNITED STATES DEPARTMENT OF AGRICULTURE
Bureau of Public Roads

STATE HIGHWAY MILEAGE BUILT - 1931

STATE RURAL ROAD MILEAGE ON STATE HIGHWAY SYSTEMS IMPROVED AND SURFACED DURING 12-MONTH PERIOD SHOWN

(COMPILED FROM REPORTS OF STATE AUTHORITIES)

STATE (YEAR ENDS DECEMBER 31, 1931 EXCEPT AS NOTED) 1/	TOTAL MILEAGE IMPROVED AND SURFACED	EARTH 2/ ROADS IMPROVED (GRADED AND DRAINED)	NEW SURFACING PLACED 3/				ON OLD SURFACE	SAND-CLAY AND TOPSOIL			GRAVEL, SHORT, ETC. (TREATED & UNTREATED)			WATERBOUND MACADAM (TREATED & UNTREATED)			BITUMINOUS MACADAM BY PENETRATION			BITUMINOUS CONCRETE (INCLUDING SHEET ASPHALT)			PORTLAND CEMENT CONCRETE			BLOCK PAVEMENT, VITRIFIED BRICK			STATE
			TOTAL	SUB-TOTAL LOW TYPE	SUB-TOTAL HIGH TYPE	ON EARTH ROADS	OF OTHER TYPES	OF SAME TYPE (RECONSTRUCTION)	NON-SURFACED	OTHER TYPES	SAME TYPE	NON-SURFACED	ON OTHER TYPES	SAME TYPE	NON-SURFACED	OTHER TYPES	SAME TYPE	NON-SURFACED	ON OTHER TYPES	SAME TYPE	NON-SURFACED	ON OTHER TYPES	SAME TYPE	NON-SURFACED	OTHER TYPES	SAME TYPE	NON-SURFACED	OTHER TYPES	SAME TYPE	
ALABAMA 1/	576	97	479	226	253	443	66	-	93	-	-	101	16	-	-	-	-	-	-	-	-	-	-	213	21	-	-	-	-	ALABAMA
ARIZONA	175	55	118	114	4	116	2	-	-	-	-	53	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	ARIZONA
ARKANSAS	953	130	823	507	316	458	198	167	-	-	-	338	-	-	187	-	-	-	-	-	-	-	-	158	42	-	-	-	-	ARKANSAS
CALIFORNIA	1,910	11	1,899	1,766	133	1,778	121	51	-	-	-	195	92	61	73	-	-	-	-	-	-	4	26	141	11	39	-	-	-	CALIFORNIA
COLORADO	882	10	872	868	4	867	5	34	-	-	-	297	-	-	-	-	-	-	-	-	-	-	-	51	-	-	-	-	-	COLORADO
CONNECTICUT	115	5	110	64	46	58	57	1	-	-	-	2	6	-	48	6	1	1	5	-	-	-	-	7	42	-	-	-	-	CONNECTICUT
DELAWARE	71	1	70	68	2	68	2	18	-	-	-	1	-	-	46	-	11	-	-	-	-	-	-	10	14	-	-	-	-	DELAWARE
FLORIDA	640	156	484	158	326	115	215	54	-	-	-	-	-	-	146	-	-	-	-	-	26	13	-	4	5	-	-	-	-	FLORIDA
GEORGIA 1/	903	127	776	139	594	184	195	161	92	-	3	17	-	-	36	23	8	35	74	26	1	98	-	62	34	-	-	-	-	GEORGIA
IDAHO	505	69	436	436	-	318	2	134	-	-	-	117	8	134	-	-	-	-	-	-	-	-	-	-	-	-	2	60	-	IDAHO
ILLINOIS	827	116	711	-	711	698	61	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	84	1	-	2	60	-	ILLINOIS
INDIANA	463	40	423	38	385	76	268	7	-	-	-	208	-	-	7	-	3	-	66	-	-	-	-	42	292	3	-	-	-	INDIANA
IOWA	2,068	251	1,817	1,817	1,817	1,817	1,817	1,817	-	-	-	1,817	-	-	-	-	-	-	-	-	-	-	-	82	135	-	-	-	-	IOWA
KANSAS	3,525	194	3,331	3,324	217	2,666	647	2,164	1/ 485	1/ 508	1/ 2,091	2,684	-	-	-	-	-	-	-	-	-	-	-	21	47	-	-	-	-	KANSAS
KENTUCKY	1,007	290	717	446	338	515	316	57	-	-	-	185	1	15	271	19	42	2	132	-	-	-	-	40	116	-	-	-	-	KENTUCKY
LOUISIANA	2,139	218	1,920	1,320	598	582	98	240	-	-	-	604	2	582	-	-	-	-	-	-	-	29	-	22	125	4	-	-	-	LOUISIANA
MAINE	180	4	176	176	42	80	17	61	-	-	-	88	-	88	-	-	-	2	16	-	-	-	-	4	22	4	-	-	-	MAINE
MARYLAND 1/	147	-	147	41	106	101	22	6	-	-	-	41	-	-	-	-	-	26	4	-	17	4	-	28	1	-	-	-	-	MARYLAND
MASSACHUSETTS	169	-	169	-	169	169	22	-	-	-	-	-	-	-	-	-	-	14	34	24	9	16	7	10	28	22	-	-	-	MASSACHUSETTS
MICHIGAN	867	199	668	295	387	182	276	198	-	-	-	126	-	101	-	-	-	-	-	-	-	46	-	58	232	57	-	-	-	MICHIGAN
MINNESOTA	3,917	993	2,924	1,579	858	811	7	1,108	-	-	-	370	-	1,002	-	-	-	-	-	-	-	-	-	135	7	5	-	-	-	MINNESOTA
MISSISSIPPI 1/	200	134	66	-	66	51	17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	51	17	-	-	-	-	MISSISSIPPI
MISSOURI	3,979	1,910	2,069	1,684	384	1,994	67	67	-	-	-	1,609	-	-	-	-	-	-	10	-	-	-	-	340	37	57	-	-	-	MISSOURI
MONTANA	798	58	740	588	152	163	-	112	-	-	-	736	-	112	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	MONTANA
NEBRASKA	2,439	262	2,177	1,939	238	869	244	92	-	-	-	690	35	92	-	-	-	-	-	-	-	-	-	14	207	-	-	-	-	NEBRASKA
NEVADA	524	-	524	521	3	520	28	404	-	-	-	100	11	404	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NEVADA
NEW HAMPSHIRE	189	-	189	143	46	135	66	24	-	-	-	116	-	24	3	-	-	1	5	-	-	2	-	5	35	-	-	-	-	NEW HAMPSHIRE
NEW JERSEY	139	-	139	-	139	68	71	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	53	72	-	-	-	-	NEW JERSEY
NEW MEXICO	482	205	277	185	92	278	2	180	-	-	-	236	-	180	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	NEW MEXICO
NEW YORK	1,176	16	1,160	16	1,144	377	623	132	-	-	-	13	1	-	-	-	-	86	60	52	35	169	16	262	456	42	-	-	-	NEW YORK
NORTH CAROLINA	716	11	705	705	-	181	307	93	11	-	180	14	-	74	32	-	-	31	54	12	-	29	3	50	115	2	-	-	-	NORTH CAROLINA
NORTH DAKOTA	1,767	663	1,104	1,093	11	873	-	325	-	-	-	868	-	325	-	-	-	-	-	-	-	-	-	11	-	-	-	-	-	NORTH DAKOTA
OHIO	994	27	967	82	885	39	585	35	-	-	-	-	31	-	-	36	14	1	95	-	-	91	-	195	275	20	1	67	1	OHIO
OKLAHOMA	998	377	621	379	242	582	39	-	-	-	-	370	-	-	-	-	-	-	39	-	-	-	-	193	92	-	-	-	-	OKLAHOMA
OREGON	525	168	357	279	78	90	80	233	-	-	-	48	-	233	-	-	-	-	73	-	-	-	-	3	72	-	-	-	-	OREGON
PENNSYLVANIA 1/	1,031	-	1,031	362	669	881	125	35	-	-	-	19	-	-	236	38	12	2	3	-	-	23	1	54	122	11	-	2	5	PENNSYLVANIA
RHODE ISLAND	94	-	94	-	94	94	94	-	-	-	-	-	-	-	-	-	-	21	9	-	1	-	-	14	10	-	-	-	-	RHODE ISLAND
SOUTH CAROLINA	1,160	228	932	898	666	519	646	-	119	-	-	87	152	-	-	-	-	-	-	-	-	-	-	373	293	-	-	-	-	SOUTH CAROLINA
SOUTH DAKOTA	675	208	467	381	86	441	-	-	-	-	-	381	-	-	-	-	-	-	-	-	9	-	-	82	-	-	-	-	-	SOUTH DAKOTA
TENNESSEE 1/	1,296	994	302	302	-	277	25	13	-	-	-	-	-	-	16	-	16	60	26	-	-	-	-	16	14	-	-	-	-	TENNESSEE
TEXAS	2,798	1,990	1,808	82	1,726	1,798	96	6	-	-	-	30	-	-	31	-	-	198	57	6	1	6	-	548	14	-	2	-	-	TEXAS
UTAH	684	80	604	546	58	509	824	98	-	-	-	388	208	98	-	-	-	-	37	-	-	7	-	-	9	8	-	-	-	UTAH
VERMONT	177	-	177	36	141	-	154	31	-	-	-	-	-	31	-	-	-	-	118	-	-	24	-	-	24	7	-	-	-	VERMONT
VIRGINIA	563	43	520	520	86	572	96	6	61	-	-	263	-	-	230	-	-	21	85	-	-	-	-	17	14	5	-	-	-	VIRGINIA
WASHINGTON	1,303	40	1,272	1,272	100	228	66	1,100	-	-	-	198	-	1,074	-	-	-	-	85	-	-	-	-	9	60	20	-	-	-	WASHINGTON
WEST VIRGINIA	1,018	126	892	592	300	357	252	320	-	-	-	170	11	320	113	6	-	47	172	33	-	5	1	53	69	7	-	3	-	WEST VIRGINIA
WISCONSIN	2,068	584	1,484	1,189	295	577	566	364	-	-	-	131	-	913	79	-	-	-	-	-	-	5	1	-	366	10	-	-	-	WISCONSIN
WYOMING	585	284	301	301	-	301	-	-	-	-	-	301	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	WYOMING
SUB-TOTAL	44,634	10,095	34,539	22,026	12,513	17,812	7,171	9,556	690	508	2,274	9,848	547	6,406	1,186	130	139	726	975	236	91	604	59	5,066	4,257	346	5	150	6	SUB-TOTAL
TOTAL	44,634	10,095	34,539	34,539		34,539			3,772			16,901			1,453			1,939			749			9,664			161		TOTAL

NOTES: 1/ IN STATES NOT USING CALENDAR YEAR THE YEARS END AS FOLLOWS: ALABAMA AND MARYLAND, SEPTEMBER 30; GEORGIA AND TENNESSEE, JUNE 30; PENNSYLVANIA, MAY 15; AND MISSISSIPPI, JANUARY 31, 1932.
2/ COLUMN SHOWS MILES OF PREVIOUSLY UNIMPROVED EARTH ROADS, IMPROVED TO AN ESTABLISHED GRADE, AND DRAINED.
3/ SUBDIVISION ACCORDING TO LOW AND HIGH TYPES, AND ALSO ACCORDING TO TYPE OF ROAD ON WHICH PLACED; LOW TYPES INCLUDE SAND-CLAY, GRAVEL AND WATERBOUND MACADAM, HIGH TYPES INCLUDE BITUMINOUS MACADAM AND BETTER TYPES.
4/ THE ONLY TYPE OF BLOCK PAVEMENT BUILT IN 1931 WAS VITRIFIED BRICK. FLORIDA INDICATED ASPHALT BLOCK PAVEMENT MILEAGE BY ADDITION OF 10 MILES FROM LOCAL ROADS.
5/ EXCLUDES 279 MILES OF OIL SURFACING PLACED ON EXISTING GRAVEL SURFACE
6/ EXCLUDES 288 MILES OF OIL SURFACING PLACED ON EXISTING GRAVEL SURFACE
7/ INCLUDES 95 MILES OF ROAD NINE FEET WIDE.
8/ INCLUDES BITUMINOUS MIXED MATERIAL AS FOLLOWS: 6) MILES ON NON-SURFACED EARTH, 526 MILES REPLACING OTHER TYPES OF SURFACE, AND 14 MILES ON SAND TYPE.
9/ INCLUDES 271 MILES REGRADED AND DRAINED.
10/ EXCLUDES 1,298 MILES OF OIL SURFACING PLACED ON EXISTING GRAVEL SURFACE

Accident Fatal to Oscar P. Chamberlain, December Tenth

WITH deep regret we record the sudden passing of Colonel Oscar P. Chamberlain, Civil Engineer, a director of the National Crushed Stone Association and a widely-known figure in industrial circles. Col. Chamberlain was fatally injured by an automobile on December 10 while crossing Michigan Avenue at Randolph Street, Chicago.

Colonel Chamberlain was 62 years old, a native of Pittstown, New York. He spent the greater part of his business career in Chicago, holding many responsible positions. In recent months he had virtually retired from active business although he maintained offices at 111 West Washington Street.

He was former president of Dolese and Shepard Company of Chicago, well-known producers of crushed stone. He had been with this organization for twenty-seven years until last August. He was also a former president of the C. & I. W. Railroad; general manager of the Union Paving Company; and a director of the Woodland Clay Products Company.

Colonel Chamberlain served in the World War from 1917 to 1919, starting as a major. He was promoted to lieutenant colonel shortly afterward, and in 1920 was made a reserve colonel. His chief activities were at Washington, D. C., where he supervised the construction of millions of dollars worth of military property. He is survived by two sisters: Mrs. A. R. Wagenknight of La Grange, Illinois and Mrs. E. W. Boodell of Brooklyn, N. Y.

Labor-Saving Machines Make More Jobs

IN A RECENT address over the radio S. M. Kintner, Vice President of Westinghouse Electric & Manufacturing Company refutes the unthinking claim that our unemployment may be laid at the door of modern machine methods. Mr. Kintner said in part.

"Unemployment is a matter of world-wide concern, and it is only fair that some thought be given to the part played by technical progress and its production of labor-saving machinery, in creating such a condition.

"As one walks through great factories—he cannot fail to be impressed by the great amount of labor saving machinery and consequently the large output of product per unit of labor employed. However, it is not safe to draw conclusions from that observation alone. . . . Think of the millions employed today in the automobile industry —in the making, the selling and servicing of the large number of such mechanisms, whereas fifty years ago there were none. The same lesson can be learned from studies of the electrical industry . . . and other industries created as it were from nothing, but now employing millions.

"The general use of power, developed by waterfalls or steam and distributed by means of electricity, and of power produced by the mobile internal combustion engine, in contract to one hundred years ago when the efforts of beasts of burden and those of human beings were the principal sources of power, has completely changed our methods of living.

"Out at Hoover Dam is being done a job larger than the Egyptian pyramids. It is being done in a few years, instead of in several lifetimes—by electric shovels and cableways and other machinery, instead of by an army of straining slaves, bleeding under the lash. The equivalent of the machinery on that construction job, in terms of human labor, would run into figures that would look like the census, and yet machinery has not robbed that vast imaginary multitude of work; for with hand labor the enterprise could not have been thought of and, even as it is, there is a very respectable city of workers on the spot.

"Technical progress is still hard at work, creating good new jobs by the million for tomorrow, not only in new lines, but in old ones. When hard times struck three years ago, billions of dollars worth of machinery in plants all

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF PUBLIC ROADS

STATE HIGHWAY MILEAGE – 1931

STATE HIGHWAY SYSTEM MILEAGE EXISTING AT DATE OF YEAR SHOWN

(COMPILED FROM REPORTS OF STATE AUTHORITIES)

STATE	DATE (YEAR 1931)	GRAND TOTAL MILEAGE, STATE HIGHWAY SYSTEM 1/	EARTH ROADS, NON-SURFACED: TOTAL NON-SURFACED MILEAGE	EARTH ROADS, NON-SURFACED: UNIMPROVED AND PARTLY GRADED	EARTH ROADS, NON-SURFACED: IMPROVED TO ESTABLISHED GRADE, AND DRAINED	TOTAL SURFACED MILEAGE	SUB-TOTAL: LOW TYPE SURFACE 2/	SUB-TOTAL: HIGH TYPE SURFACE 3/	SURFACED ROADS BY TYPE: SAND-CLAY AND TOP SOIL	GRAVEL (MACT., ETC.) (TREATED AND UNTREATED)	WATERBOUND MACADAM (TREATED AND UNTREATED)	BITUMINOUS MACADAM BY PENETRATION	BITULITHIC CONCRETE (INCLUDES SHEET ASPHALT)	PORTLAND CEMENT CONCRETE	BLOCK PAVEMENT: VITRIFIED BRICK	BLOCK PAVEMENT: BLOCK ASPHALT (A) WOOD (W) STONE (S)	REVISION OF SYSTEM DURING YEAR, MILEAGE ADDED OR SUBTRACTED	STATE
ALABAMA	9/30	5,548	1,558	882	676	3,990	2,952	1,038	-	1,024	-	1,906	92	166	153	719	-	-	22	ALABAMA
ARIZONA	12/31	2,747	773	473	300	1,974	1,780	194	-	190	-	1,550	-	24	66	142	-	-	114	ARIZONA
ARKANSAS	12/31	8,705	1,922	636	786	7,783	5,819	1,964	-	-	-	5,818	-	108	484	865	-	-	- 195	ARKANSAS
CALIFORNIA	12/31	7,390	2,202	1,815	394	5,188	2,074	3,106	-	-	-	2,074	-	990	807	1,892	-	-	400	CALIFORNIA
COLORADO	12/31	5,255	4,605	4,195	410	650	4,204	446	-	66	-	4,138	-	-	15	431	-	-	22	COLORADO
CONNECTICUT	12/31	2,351	97	-	97	2,134	1,196	938	-	-	-	290	306	308	195	533	2	-	57	CONNECTICUT
DELAWARE	12/31	876	4	-	4	872	69	803	-	-	-	69	20	48	18	731	6	-	98	DELAWARE
FLORIDA	12/31	6,338	3,472	1,098	374	4,866	3,542	1,324	-	868	-	75	2,090	155	319	521	262	- (A) 67	1,675	FLORIDA
GEORGIA	6/30	7,151	3,064	2,058	956	4,087	2,700	1,387	1,750	-	-	687	253	458	297	761	1	-	7	GEORGIA
IDAHO	12/31	4,788	1,616	1,139	477	3,172	2,938	234	-	34	-	2,904	-	-	155	55	-	-	283	IDAHO
ILLINOIS	12/31	10,080	1,719	1,575	144	8,361	7	8,354	-	-	-	6	1	3	15	8,133	201	-	191	ILLINOIS
INDIANA	12/31	6,272	201	-	201	6,071	1,144	4,927	-	-	-	2,203	951	998	67	2,895	97	-	861	INDIANA
IOWA	12/31	8,512	968	681	287	7,544	1,982	6,062	-	-	-	5,260	-	-	-	6,026	33	-	627	IOWA
KANSAS	12/31	9,982	4,176	3,810	366	6,806	3,548	3,258	5/ 3,130	-	-	418	-	174	3	919	162	-	292	KANSAS
KENTUCKY	12/31	5,990	752	-	752	5,198	3,754	1,444	-	-	-	1,176	2,578	818	25	601	4	-	- 2,050	KENTUCKY
LOUISIANA	12/31	17,180	6,846	6,340	506	10,334	2,222	1,112	-	-	-	9,259	-	16	152	1,048	6	-	6,658	LOUISIANA
MAINE	12/31	2,050	99	90	9	1,951	1,952	198	-	4	-	1,539	3	295	-	154	-	-	7	MAINE
MARYLAND	9/30	3,412	-	-	-	3,412	1,703	1,709	-	-	-	560	1,193	78	169	1,446	1	-	199	MARYLAND
MASSACHUSETTS	12/31	1,699	-	-	-	1,699	234	1,465	-	-	-	55	179	896	235	331	-	(S) 3	75	MASSACHUSETTS
MICHIGAN	12/31	8,243	673	403	270	7,570	4,016	3,554	104	-	-	3,429	503	97	380	3,016	11	-	184	MICHIGAN
MINNESOTA	12/31	5,807	108	22	86	5,707	1,832	3,875	77	8/ 61	-	-	-	76	1,283	13	- (W) 8	-	- 26	MINNESOTA
MISSISSIPPI	1/31/32	6,078	835	165	670	5,243	4,722	521	1	-	-	4,710	11	51	21	436	13	-	- 23	MISSISSIPPI
MISSOURI	12/31	9,167	1,584	855	729	7,583	4,476	3,107	-	-	-	4,476	-	141	-	2,945	21	-	721	MISSOURI
MONTANA	12/31	8,148	2,502	2,178	324	5,646	2,587	59	51	-	-	2,536	-	17	7	39	-	-	-	MONTANA
NEBRASKA	12/31	9,752	4,180	3,901	279	5,572	5,079	493	9	-	-	5,070	-	-	17	485	51	-	-	NEBRASKA
NEVADA	12/31	5,797	1,998	1,859	139	3,858	1,789	70	-	-	-	1,759	-	26	11	42	-	-	23	NEVADA
NEW HAMPSHIRE	12/31	2,683	36	5	31	2,647	2,231	416	-	-	-	2,127	104	163	46	207	-	-	135	NEW HAMPSHIRE
NEW JERSEY	12/31	1,877	197	182	15	1,680	118	1,562	-	-	-	65	53	16	260	1,235	6	9/ (MAC) 46	6	NEW JERSEY
NEW MEXICO	12/31	5,272	6,376	4,730	1,646	2,896	2,804	92	-	-	-	2,804	-	-	77	17	-	-	- 62	NEW MEXICO
NEW YORK	12/31	14,000	2,315	2,311	4	11,685	1,531	10,154	-	-	-	101	1,430	3,438	709	5,794	196	10/ (AS) 17	- 15	NEW YORK
NORTH CAROLINA	12/31	9,752	1,352	112	1,240	8,400	4,057	4,343	3,258	-	-	569	230	11/ 663	1,089	2,632	1	(W) 18	1,047	NORTH CAROLINA
NORTH DAKOTA	12/31	12/ 7,586	3,522	2,231	1,291	4,064	4,062	22	-	13/	-	4,062	-	-	1	23	-	-	195	NORTH DAKOTA
OHIO	12/31	11,559	89	89	-	11,470	5,415	6,055	-	-	-	4,175	1,280	1,637	500	2,411	1,507	-	216	OHIO
OKLAHOMA	12/31	6,890	2,807	2,188	619	4,083	2,193	1,890	-	-	-	2,193	-	-	275	1,539	40	-	495	OKLAHOMA
OREGON	12/31	4,468	703	263	440	3,765	2,382	1,383	-	-	-	2,382	-	469	882	228	-	-	116	OREGON
PENNSYLVANIA	5/15	13,561	2,570	-	2,570	10,923	4,032	6,961	-	-	-	1,363	2,669	408	473	5,725	396	14/ (AMS) 10	62	PENNSYLVANIA
RHODE ISLAND	12/31	1,040	453	258	195	603	132	481	-	-	-	26	96	228	122	131	-	-	37	RHODE ISLAND
SOUTH CAROLINA	12/31	5,956	620	424	196	5,336	3,210	2,126	2,474	-	-	693	43	4	446	1,677	-	-	- 37	SOUTH CAROLINA
SOUTH DAKOTA	12/31	5,957	1,505	908	597	4,452	4,320	132	22	-	-	4,298	-	-	5	127	-	-	- 19	SOUTH DAKOTA
TENNESSEE	6/30	7,053	1,156	121	1,035	5,897	3,495	2,402	-	-	-	2,346	1,124	901	218	1,276	17	-	9	TENNESSEE
TEXAS	12/31	18,868	7,283	4,860	2,423	11,585	6,982	4,603	730	-	-	5,575	877	400	1,643	2,533	46	-	195	TEXAS
UTAH	12/31	4,108	1,695	952	1,043	2,413	2,081	332	-	-	-	2,081	-	82	248	-	-	-	672	UTAH
VERMONT	12/31	15/ 1,013	-	-	-	1,013	375	638	-	-	-	375	-	195	-	243	-	-	3,191	VERMONT
VIRGINIA	12/31	8,032	1,838	1,637	201	6,194	4,592	1,602	595	-	-	2,597	1,430	730	67	796	-	-	344	VIRGINIA
WASHINGTON	12/31	3,799	486	270	116	3,373	2,954	1,019	-	-	-	2,954	-	-	40	968	11	-	511	WASHINGTON
WEST VIRGINIA	12/31	4,315	1,040	591	449	3,275	1,055	2,220	-	-	-	1,013	42	1,093	160	867	100	-	151	WEST VIRGINIA
WISCONSIN	12/31	10,218	895	-	895	9,323	5,599	3,724	46	-	-	4,943	610	146	16	3,562	1	-	- 3	WISCONSIN
WYOMING	12/31	3,231	1,260	786	474	1,971	1,936	35	-	16/	-	1,936	-	-	27	8	-	-	104	WYOMING
TOTAL		328,542	86,242	61,319	24,923	242,700	146,359	96,341	14,409		112,800	19,357	15,356	10,312	67,348	3,156		(A) 91 (W) 36 (S) 44	4,446	TOTAL

NOTES: 1/ HIGHWAYS SELECTED OR DESIGNATED BY LAW AS STATE HIGHWAY SYSTEMS; EXCLUDING STATE SUPERVISED ROADS NOT ON STATE SYSTEM AND ROADS UNDER COUNTY OR TOWN AUTHORITIES.
2/ INCLUDES SAND-CLAY, GRAVEL AND WATERBOUND MACADAM.
3/ INCLUDES BITUMINOUS MACADAM BY PENETRATION AND BETTER TYPES.
4/ OIL-SURFACED EARTH ROADS.
5/ INCLUDES 609 MILES OF BITUMINOUS MIXED MATERIAL.
6/ EXCLUDES MILEAGE AUTHORIZED BY STATE LEGISLATURE BUT NOT ACTUALLY DESIGNATED AND WHICH HAS BEEN INCLUDED IN PREVIOUS REPORTS.
7/ 4,530 MILES UNIMPROVED EARTH AND 2,128 MILES OF GRAVEL ROAD ADDED TO SYSTEM.
8/ INCLUDES 1,882 MILES OF SURFACE-TREATED GRAVEL.
9/ CONSISTS OF THREE MILES OF ASPHALT BLOCK, SIX MILES OF WOOD BLOCK AND 37 MILES OF STONE BLOCK
10/ CONSISTS OF 14 MILES OF ASPHALT BLOCK AND THREE MILES OF STONE BLOCK.
11/ INCLUDES 595 MILES OF SAND-ASPHALT ROAD.
12/ SYSTEM INCREASED BY LAW TO MAXIMUM OF 7,600 MILES
13/ INCLUDES 157 MILES SURFACE-TREATED GRAVEL ROADS.
14/ CONSISTS OF SEVEN MILES ASPHALT BLOCK, TWO MILES WOOD BLOCK AND ONE MILE OF STONE BLOCK ROADS.
15/ NEW STATE HIGHWAY SYSTEM CREATED BY ELIMINATING STATE-AID SYSTEM NOW TO BE CLASSIFIED WITH TOWN ROADS.
16/ INCLUDES 906 MILES OF OIL-TREATED GRAVEL ROAD

over the country was carefully put away, until it should be needed. When its owners take it out again to use, they will find much of it as useless as if they had let it rust—technical progress since 1929 has made it as out of date as a three year old suit of clothes found in an old trunk. Even in three years, new machinery has been made so much faster, lighter, safer, more efficient, that it will not pay to use the old. And the re-equipping of the country with modern machinery will alone go far to make prosperity.

"Still greater possibilities lie in the now undreamed of arts, businesses and industries that this fairy of technical progress will almost certainly produce from her magic box. Fifty years ago, men found they could use electricity for light. Forty years ago it was running streets everywhere. Thirty years ago, it was driving factories, and producing new materials. It is only twelve years since it began to be a voice to reach the universal ear, and it seems only yesterday that it became the universal amusement, the sole actor in ten thousand theaters.

Why should we suppose that its possibilities are exhausted? Is it not reasonable to expect that new industries, each demanding an army of workers, will appear from the source whence so many have already miraculously appeared?

So many prophesies of the past that have sounded a warning of a finished world, have proven so foolish when viewed in the light of subsequent events, that it must take a brave, and I might add, foolish man to record his opinion to that effect.

"No doubt the tendency of the age towards shorter and shorter working time will continue. Furthermore, it is highly probable that as we work more into this new order of things, workers will enter active work at a later period than now, and similarly retire at an earlier period in their lives. . . . Many of us have witnessed the change in working hours, first from sun-up to sun-down in the earliest days of this generation, to a twelve-hour day, then a ten-hour day; to be followed by an eight-hour day—now we are likely approaching a six-hour day, and the present change is much greater than the preceding ones and, consequently, more difficult to adjust.

"Who would want to retrace our steps and throw away all our labor-saving machines, in order that we might have more jobs? Surely no one who gives the question serious thought. What is needed is a new plan of operation that will give due consideration to our new order of things and permit us to enjoy this millenium of freedom from drudgery and leisure for thought and pleasure—the end towards which we have all striven for so long. Such a plan to be successful must still hold out reward for the ones who do the best in still further improving conditions. The incentive to do better must still be preserved."

"How is Walker?"
"Flat on his back."
"But I saw him dancing with a dizzy blonde last night."
"So did his wife."

Harry: "I'm forgetting women."
George: "So am I. I'm for getting a couple as soon as possible."

European Highways

IN EUROPE during 1931 and 1932 there has been a marked decrease in highway construction and improvement. A decrease in highway revenues and appropriations due to financial conditions has caused the suspension of ambitious roadbuilding programs inaugurated several years ago. A few countries have made highway work an unemployment relief measure but a great number have limited the work to necessary maintenance of existing roads.

The table below shows the U. S. Department of Commerce, Foreign Construction Division, current survey of highway mileages by types of construction in various European countries. It is interesting to note that the total highway mileage for Europe as reported a year ago was 2,453,160 miles while the present survey shows 3,340,616 miles or an increase of 887,456. This increase is more than accounted for in the estimated figures for Russia which also includes Asiatic Russia.

MILEAGES OF EUROPEAN HIGHWAYS

EUROPE	Unimproved Earth and Non-Surfaced	Improved Earth, Sand-Clay, Gravel, Graded and Drained	Water Bound Macadam	Macadam Surface Treated Penetration, Bituminous Concrete and Sheet Asphalt	Cement Concrete	Block-Stone, Wood, Asphalt and Brick	Not Specified	Total
Aegean Islands	.....	.....	.....	.....	.....	.....	626	626
Albania	.....	1,255	.....	.....	.....	.....	.....	1,255
Austria	.....	.....	.....	.....	.....	.....	18,140	18,140
Azores	.....	348	243	.....	.....	9	.....	600
Belgium	.....	.....	2,745	77	152	3,399	12,521	18,894
Bulgaria	.....	.....	10,051	.....	.....	8	.....	10,059
Cypress	.....	2,039	881	.....	.....	.....	.....	2,920
Czechoslovakia	.....	.....	1,463	389	40	278	46,540	48,710
Danzig	.....	650	201	95	1	166	2	1,115
Denmark	.....	296	1,243	2,166	2	362	27,957	32,026
Estonia	6,790	7,400	186	21	.....	251	.....	14,648
Finland	.....	18,016	20	13	3	6	14,602	32,660
France	.....	.....	.....	.....	62	.....	405,070	405,132
Germany	.....	129,555	74,564	9,321	124	1,864	1,243	216,671
Gibraltar	.....	.....	1	14	.....	.....	.....	15
Greece	.....	6,645*	.....	74	.....	.....	.....	6,719
Hungary	17,485	5,143	.....	367	56	183	2,864	26,098
Iceland	.....	870	.....	.....	.....	.....	466	1,336
Irish Free State	.....	.....	42,236	4,209	147	43	21	46,656
Italy	.....	19,014	76,060	.....	.....	.....	10,563	105,637
Latvia	8,256	9,644	.....	601	.....	155	.....	18,656
Lithuania	18,886	8,033	766	.....	.....	.....	.....	27,685
Luxemburg	.....	300	2,178	7	12	48	.....	2,545
Malta & Gozo	.....	.....	322	.....	.....	.....	6	328
Netherlands	.....	.....	10,563	854	233	3,884	.....	15,534
Northern Ireland	.....	.....	11,102	1,823	70	.....	.....	12,995
Norway	.....	23,297†	.....	40	.....	6	.....	23,343
Poland	.....	108,228	.....	.....	.....	.....	32,752	140,980
Portugal	.....	.....	11,129	651	.....	27	.....	11,807
Rumania	23,844	5,911	36,457	.....	.....	.....	.....	66,212
Russia	1,462,109‡	208,000	.....	12,000	.....	.....	2,000	1,684,109
Spain	.....	.....	.....	1,939	284	201	51,720	54,144
Sweden	.....	81,110	.....	86	24	24	.....	81,244
Switzerland	.....	2,295	.....	6,914	26	.....	.....	9,235
United Kingdom	.....	.....	98,841	75,121	288	2,481	525§	177,256
Yugoslavia	.....	7,351	17,233	42	.....	.....	.....	24,626
Total	1,537,370	645,400	398,485	116,824	1,524	13,395	627,618	3,340,616

* Includes some macadam.
† Includes some waterbound macadam.
‡ Estimated—includes Asiatic Russia.
§ 515 miles wood block, 10 miles rubber block.

New York Notes

A bid submitted by the **Moore Construction Co., Inc.** of Buffalo for elimination of the Pony Farm, Crandall and West Oneonta Road grade crossings on the Delaware and Hudson in Oneonta and Otego has been approved by the Public Service Commission of New York.

The Erie Railroad has received approval from the New York Public Service Commission of the bid submitted by **J. M. Ludington's Sons, Inc.**, of Rochester for the elimination of the Paterson grade crossing located two miles west of Painted Post station at Erwin.

Delaware Notes

George & Lynch of Dover with their bid of $160,110 were low bidders on the 3.73 miles of the Dual Road between Smyrna and Reynolds Corner on the proposals received November 29. This contract includes 74,000 cubic yards of excavation, 10,300 cubic yards of concrete pavement, 5,900 lineal feet of exp. joint and 400 tons of bituminous concrete.

Ohio Notes

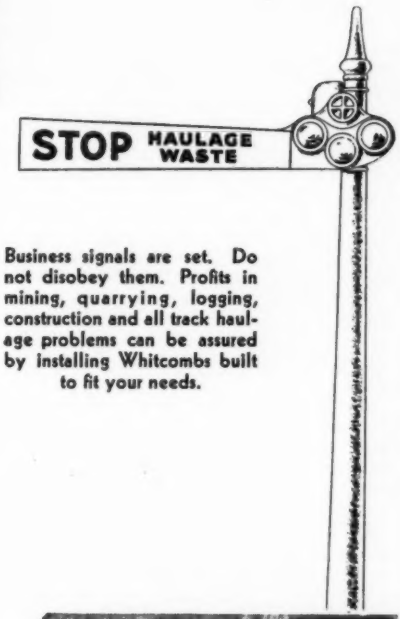
On bid submitted November 22nd, **Geo. W. Timmons** of Columbus was awarded grading, structures, girder bridge and culvert on 119 in Adams County. The contract totals $88,195.

A. J. Baltes of Norwalk received a concrete paving job on U. S. 36 in Coshocton County totaling $12,561.

The Thorpe Construction Company of Cleveland was awarded a reinforced concrete widening job on 460 in Cuyahoga County on bid of $35,226.

Wilmore Paving Company of Middletown bid $82,234 and secured grading and structures for relocation on 60 in Greene County.

MOVING MOUNTAINS at MOLE-HILL EXPENSE



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SUBSIDIARY OF THE BALDWIN LOCOMOTIVE WORKS
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A 16-page bulletin on Industrial Locomotives of various kinds. Also our magazine HAUL-AGE. Both free upon request. Write for them.

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For your convenience in writing to The Whitcomb Locomotive Company, you will find a card bound in this issue.

Shots From the Firing Line— *Continued*

Detroit and Vicinity

By CLYDE B. DAVIS

Work on bridge and grade separation construction is to be pushed to the limit of Wayne County finances during the fall and winter months, Edward N. Hines, of Detroit, county road commissioner, announced November 12. Under provision of the McNitt Act, 272 miles of township roads have been taken over by the county for improvement and maintenance, and the bridges on nearly all these roads are too narrow and of too light construction for present day traffic requirements. Practically every bridge needs replacement, the commissioner said. Each new bridge will have a 30-foot clear roadway and where feasible will be of reinforced concrete deck girder type, permitting future widening with little sacrifice to present investment.

The state highway department has let a contract for widening the Huron River bridge at Flat Rock and this includes the widening of Telegraph Road to 40 feet of concrete in Monroe County.

Work is to be started on the grade separation at the Pere Marquette Railroad crossing and the Six Mile Road, and construction has begun to lengthen the Pennsylvania Railroad bridge over the Outer Drive in Allen Park, where the dual sections of concrete bring the road to its 150-foot width.

The present program involves work on about 15 other bridges. One of the more important is the reconstruction of the Michigan superhighway bridge over River Rouge in Dearborn, where the north strip of pavement will be demolished and the bridge carrying the south strip will be widened for an 80-foot roadway and two sidewalks.

Increased transportation of all kinds is evident following the November election. In the first week the street car transportation to factories increased more than 20,000 daily, made up principally by increased activity at scores of small plants. In all lines of business there is a feeling of assurance and optimism. Bank clearings increased about a million and a half dollars within a week after the election. Industrial and business leaders attributed the increase to removal of uncertainty and to the overwhelming mandate given the new government, doing away with doubt as to ability to carry on any program successfully.

The way has been cleared for **prompt development of the Monroe Port District** to cost between $700,000 and $800,000, by payment by the Port District of $50,000 to the Government as its part of the first installment. The Government is to pay half the cost and $35,000 a year for maintenance. More than a dozen contractors have sent crews to Monroe to prepare estimates for bids, which will be advertised for as soon as possible by the Government.

The Construction Materials Corporation of Chicago has been awarded the contract for deepening the Ballard Reef Channel in the Detroit River at $980,167. Work will begin in the spring, Maj. R. C. Crawford, U. S. District Engineer, said and is to be completed by June 30, 1935. The 22-foot channel is to be deepened to 28 feet to provide for a 24-foot draft. The channel extends 7,000 feet north of the Livingstone Channel, up to Fighting Island Channel. It is 600 feet wide.

The city commission of Grand Rapids has approved **construction of a tunnel** between the new civic auditorium and the Lyon street sidewalk across the avenue, a procedure which varies from the original plan to have the tunnel exit in the basement of the Pantlind Hotel. However, the hotel was voted permission to build a tunnel from the hotel to connect, at its own expense. The commission vetoed a proposition to shorten the tunnel and save about $7,000.

Dredging operations for the improvement of Fighting Island channel were started the last week in November, the work to be completed by August 15, 1933, according to Maj. R. C. Crawford, District Engineer. During this period the hydraulic dredge Shamrock will be operating in shoal areas on both sides of the channel. Operations during the remainder of the 1932 navigation season are to be confined to the westerly 200-foot width of the channel, opposite Grassy Island. Maj. Crawford has issued a warning that vessels passing the operations should proceed with caution.

The state administrative board has approved about **$100,000 in road construction**, including 2.8 miles on U. S. 27 for 20-feet sheet asphalt north and south of Vanderbilt, to **Road Builders, Inc.**, Detroit, for $28,032.36; 3.4 miles of grade and drainage structures south from the north county line of Charlevoix on M 131, to **John Baker & Sons**, for $30,870.49, and 5.2 miles of grade and drainage structures on M 131 from Petoskey south to the county line, to **Louis Garavaglia Co.**, Detroit, $33,227.22.

An additional 3 miles on Cannonsburg Road has been let by the Kent County road commission to **A. Chaney and B. Glupker**, of Grant, for $10,270.86, the lowest of 13 bids. It is to be gravel on a 36-foot grade, with 75 per cent of the labor from Plainfield and Cannonsburg townships. A three-fourths mile stretch from U S 131 to the beginning of the new project is to be relocated to eliminate grades and curves and will be a separate contract. The highway will have a bituminous tread, 21 feet wide.

With arrival of zero weather in lower Michigan, ice conditions have halted dredging operations in Section F of the **Livingstone Channel** project and the Dredge Herrick with its fleet of seven scows and two tugs is tied up at a dock in Wyandotte until spring. Section F extends 3,200 feet from the junction of the Amherstburg and Livingstone Channel to Crib Light No. 1. Dredging started here a month before it was stopped and all the clay has been removed from the rocks. Drilling through the water to a depth of 28 feet will do away with necessity for cofferdam construction. The general contract for the six miles of the channel deepening is in the hands of the **Arundel Corp.**

Kentucky Notes

By W. E. CHAMBERS

The following contracts were awarded during the month of November by the State Highway Department; **Lewis and Kelly** of Harlan with a bid of $46,457 were awarded the contract for grading 4 miles from Albany-Jamestown Road from end of grading about one mile south of Snow to Marlow Mill. **Foster & Creighton** of Nashville, Tennessee with a bid of $125,911 were awarded the contract for grading 6.8 miles of the Mt. Sterling-Flemingsburg Road. **R. F. Pryor & Company** of Mayfield with a bid of $25,655 were awarded the contract for grading six miles of the Columbus-Hailwell Road. **Carter, Carter & Braden** of Clay were awarded the contract for grading 8.2 miles of the Eminence - Smithfield - LaGrange Road with their bid of $31,388.

Illinois Notes

A. F. Beckman of Glen Ellyn with a bid of $46,355 received the contract for grading Section 114A in Henderson County.

Harrelson & Johnson of Harrisburg with a bid of $46,179 were awarded the contract for grading section 112A in Franklin County.

Lefferdink Construction Company of Springfield with a bid of $57,764 was awarded the contract for grading section 102A in Massac County; they were also awarded the contract for grading section 103A in Massac county. Their bid on this job was $100,375.

The Department of Public Works and Buildings, Division of Highways, received bids on December 23rd at Springfield for a large number of paving, grading and bridge projects. The grading projects involve 1,586,300 cubic yards of excavation.

Butler: "There's a woman peddler at the door, sir."

Jiggs: "Show him in, and tell him to bring his samples with him."

"Well," said the customs inspector at the Canadian border to the dusky driver of the ancient Ford. "Have you any dutiable stuff?"

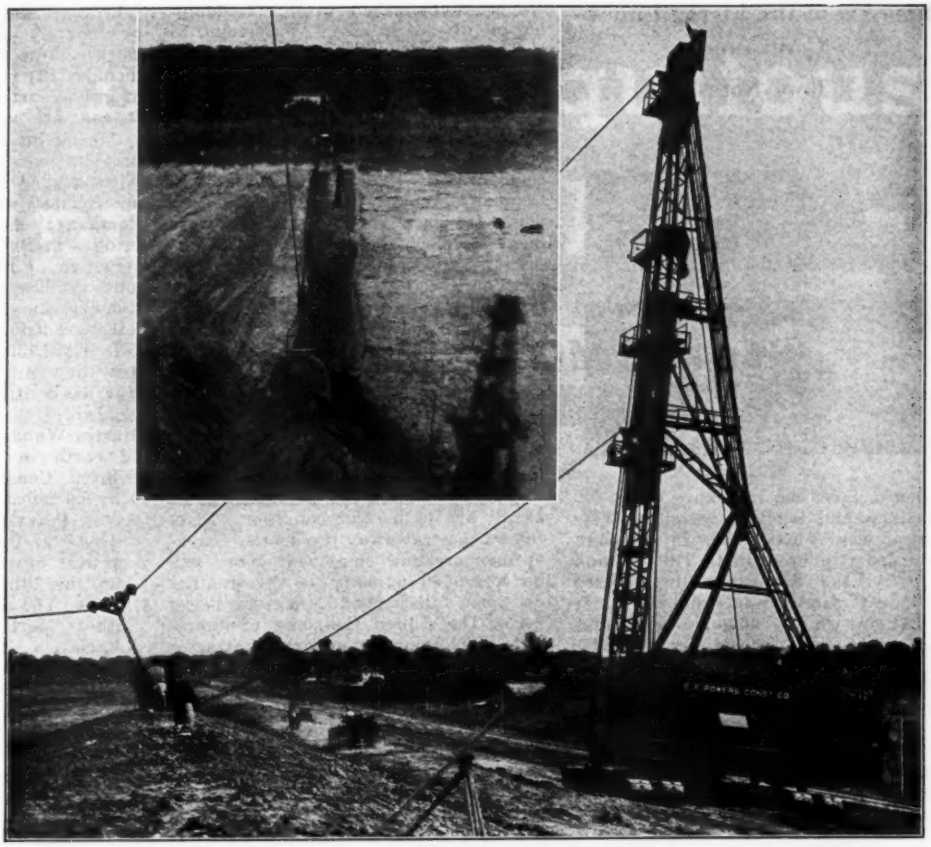
"No, sah," said the dusky driver, "I got me a couple bottles o' gin, but that ain't no duty. 'At's a pleasure."

Bandit: "What! Only thirty cents? Been playing poker, eh?"

Victim: "No, but I've been sitting with some fellows who were!"

"There are lots of couples that don't pet in parked cars."

"Yes, the woods are full of them."



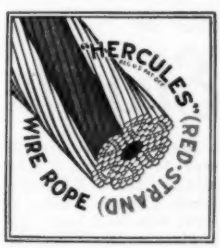
Working on the levee — Another place where wire rope durability means more dollars in profit for the contractor.

Consider the Yardage It Can Handle!

THE true value of the wire rope you use on your digging and excavating machines is told by the yardage it can handle for each dollar of its cost.

And wire rope that can handle a large yardage has another great advantage; it does not have to be renewed so often, which means that rope changing expense is much less and that the actual working time of the equipment is much greater.

If you want real wire rope economy, we would like to have you give "HERCULES" (Red-Strand) Wire Rope a chance to show you what it can do. Its ability to make and hold friends is because of its ability to give safe, dependable and economical service.



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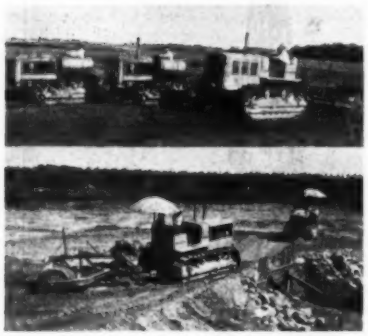
Shots From the Firing Line— *Continued*

Iowa Notes



Beu & Sons use the above outfit for stripping and loading gravel in their new pit near Clear Lake. In stripping they use two Caterpillar Thirties and a Fifty, the former hauling 1-yard LaPlant-Choate scrapers and the latter a LaPlant-Choate 50-cubic-foot automatic Roll-Over. The larger unit carried approximately a 2 yard load each trip, averaging a round trip every 3 minutes over a 225 foot haul; while the two smaller units averaged a round trip every 2¼ minutes, hauling a little better than 1 yard each trip. After removing the overburden the same units are used to haul the gravel to the dumping pit whence it moves by conveyor to the crusher.

Nebraska Notes

By CHAS. P. RODMAN

Ground was broken for the new **government office building** in Omaha, December 14th. **The Moran Construction Company**, Omaha, are sub-contractors doing the excavation work. Bids were made for 6,000 cubic yards. Two Caterpillar tractors, one with crane for steel erection and the second one for miscellaneous duties were placed on the job. About two thousand cubic yards of the work to be done is tearing out an old foundation, built in 1873. This foundation is causing much grief as it must be drilled so that a huge steel hook can pull it apart. A Schramm compresser and air drills are used in making the holes. Many of the stone blocks in this foundation are being salvaged, as all are in perfect condition. Five-ton trucks cart away the debris. Twenty men are now employed. Work will be continued as long as the weather does not fall beyond 7 degrees below zero. The Cullen Company of Janesville, Wisconsin, is general contractor for this building.

St. Louis and Vicinity

By A. J. KOENIG

Bids were received by the **Missouri State Highway Commission** on Dec. 2nd for the construction of seventy-four road and bridge projects, at approximately $1,500,000. The proposed work embraces 215 miles of road. This includes 121 miles of grading, 90 miles of gravel surfacing and 5.5 miles of 20-ft. concrete pavement.

Among the low bidders on the larger projects were the following: 14.078 miles graded earth in Barton and Jasper counties, **O. O. Fuller Construction Company**; 2.414 miles gravel and bridges in Butler county, **Service Construction Company** $161,704; 8,171 miles grading in DeKalb county, **Nevada Construction Company** $25,719; 8.196 miles graded earth in Iron county, **F. T. O'Dell** $23,159; 11.9 miles grading and graveling in Reynolds county, **Clark, Kearney & Stark**, $132,127; 13,734 miles graded earth in St. Francois county, **Martin Wunderlich**; 18.299 miles graded earth in Texas county, **Cook & O'Brien Construction Company**, $81,-922; 5.6 miles 20-ft. concrete in Platte county **Perry McGlone**, $112,246.

The War Department announced the **approval of plans for two bridges** to span the Illinois River near Grafton, Illinois. The first project is that of the Father Marquette Memorial Bridge Association of Alton, to build under authority of the state law. The other is the project of the Calhoun Bridge Company.

W. P. Gollong has contract for a 700,000-gallon reinforced concrete reservoir at Marshall, Missouri.

The Jackson County Highway Engi-

P&H (Harnischfeger Corporation)
relies on
Ebonite
For heavy-duty shovels and heavy-duty service, P & H relies on Ebonite X L Brake Lining. Ebonite Lining & Blocks withstand heat—do not glaze or "fry," increase greatly the hours between re-linings, give a soft positive brake, and reduce drum scoring.
Write for Details of TEST OFFER
L. J. MILEY COMPANY
1457 S. Michigan Avenue, Chicago, U.S.A.

USE
ONLY THOSE BUCKETS with which you can MAKE A PROFIT
IN these days of price competition, when you have to trim your estimate to the bone, the big question is: How are you going to make a profit?
Be sure the buckets you select won't fall down on the job, cause time out, or require costly repairs. It is better to play safe and choose a good reliable, trustworthy Hayward Bucket that will speed up the work and still be in fine condition for other jobs to come.
Write for new reduced prices on your requirements.
THE HAYWARD COMPANY, 52-54 Church St., N. Y.
Hayward Buckets

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"The most ubiquitous equipment at Hoover Dam" WRITES SIX COMPANIES, INC.

FOURTEEN versatile "Caterpillar" Tractors hustle along important construction details for the builders of Hoover Dam. Their power, stamina, and traction come in handy at bulldozing shelves along rocky grades. They maneuver nimbly in close quarters to move and spot heavy equipment. They reach over cliffs with hoist and cable to transfer loads quickly and cheaply. After a flood, their broad, sure-treading tracks walked right over the silt and trash. And they speedily cleared away the debris from a diversion tunnel to save important time and money! "Equipped with a variety of appliances and apparatus and doing a multitude of jobs, 'Caterpillar' Tractors are undoubtedly the most ubiquitous equipment here," writes Six Companies, Inc.!

Caterpillar Tractor Co., Peoria, Ill., U.S.A.

Track-type Tractors Combines Road Machinery

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Prices—f. o. b. Peoria, Illinois

FIFTEEN	$1100	THIRTY-FIVE	$2400
TWENTY	$1450	FIFTY	$3675
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CATERPILLAR

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TRACTOR

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Shots From the Firing Line— *Continued*

neer awarded contract to **E. C. Childers Construction Company** for 115 ft. overhead structure and to **Drexel Construction Company** for a 449 ft. I-beam bridge over the Alton Railroad in Jackson county.

The White Eagle Oil Corporation, New York, is reported surveying for a 6-inch gasoline pipe-line from Auburn, Kansas to St. Louis and Kansas City.

The Industrial Construction Company has contract for a highway bridge over the Osage River at Tuscumbia, Missouri.

The St. Louis County Court awarded the following contracts; 10-foot concrete slab, Dale Ave. to **Skrainka Construction Company** 5842 feet of 20-foot slab, Big Bend road, to **C. A. Moreno.** 1.5 miles Dorsett road, grading and drainage, to **C. H. Atkinson Paving Co.**

Brosnahan Bros. have contract for 1.43 miles concrete paving in Leavenworth county Kansas. **Koss Construction Company** have contract for bridge in Marshall county Kansas.

Batson Bros. have contract for 9 miles of grading and drainage structures in Perry county, Arkansas.

Lund & Sager Inc. were awarded contract for concrete pavement on route 153 in Randolph and Washington counties, Illinois on their bid of $151,646.

Hartman, Clark Bros. on their bid of $146,289, were awarded contract for paving on route 97, Warren and Knox counties, Illinois.

By J. I. MORAVEC

W. S. Hardwick, Beardstown, Illinois submitted low bid at St. Louis November 12th for 600,000 yards of levee enlargement on the Illinois River in the Big Swan Drainage and Levee District in Scott County, Illinois. The Hardwick bid was 14 cents per cubic yard.

River Notes

By W. W. WHORLEY

Second New Orleans District

At the levee letting December 13, Second New Orleans District, U. S. Engineer Office, the **McWilliams Dredging Company** was low bidder on the entire Catahoula-Dauterive project of 2,630,000 yards in the West Atchafalya Basin Protection Levee at 22.7 cents. This Company was also low bidder on 1,420,000 yards in the Sorrell Levee, East Protection Levee at 25 cents.

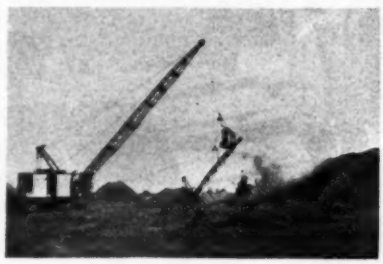
The Acme Construction Company, Pointe a la Hache, Louisiana was low bidder at the same letting on the 610,000 yards in the Lottie-Ramah levee project, East Protection Levee at 12 cents per yard.

At the letting November 28th **Dameron & Kenyon Inc.** of Port Allen, Louisiana were low at seven cents on 3,000,000 yards of Alexandria-West Levee in the Red River Division.

The Lower Coast Construction Company Limited of New Orleans was low at 27 cents at the same letting on a group of small levees in the Barataria Levee District totaling 200,000 yards.

At the November 10th letting **The Granger Construction Company** of Tallulah, Louisiana secured 77,000 yards in the Reid-Bedford Canal below Delta. The canal is 11,700 feet long, 6½ feet deep and 18 feet wide at bottom.

Bids will be opened at the U. S. Engineer's Office, Second New Orleans District, on January 3rd covering 1,140,000 yards of new Lobdell-Viola levee in the Atchafalaya Front Levee District. The work is located on the west bank of the Mississippi about six miles above Port Allen, Louisiana. The new levee has a net height of 20 to 24 feet and must be completed in 300 calendar days.



J. D. Burnett uses these two Bucyrus-Erie 45-B draglines on his levee job on the Red River.

Memphis District

Thomas F. Shea and **Hughey Brothers** of Memphis secured 368,000 yards at 15.4 cents and **J. T. Pollard-Council & Lewy** received 992,000 yards on the disputed Memphis letting covering 8½ miles of levee south of Butler, Arkansas.

At the December 13th letting at Memphis, **Brooks-Callaway Company** of Atlanta took the entire 3,817,000 yards at 11 cents flat from 23 other contracting firms. This seven miles of new levee and riverside enlargement is near Newhart and Graves Bayou, Arkansas in the Lower St. Francis.

S. G. Croxton of Fayette, Mississippi is handling the Delta Construction job of 195,000 yards in the St. Francis Drainage District in Arkansas. Mr. Croxton is using a Bucyrus-Erie 45-B dragline on this embankment.

C. W. Greeson, Opelousas, Louisiana has completed his levee work near Rena Lara, Mississippi. A Bucyrus-Erie 45-B dragline was used for wagon loading, and the excellent outputs obtained speak well for the ability of operators J. D. Blankenship, Bill Gilbert and P. R. Crose.

Here is a picture of **Barker Brothers'** job near Jeffries, Mississippi where they recently started moving 2,336,000 yards. Their Bucyrus-Erie 37-B and 43-B draglines shown here are loading to Euclid 12-yard wagons drawn by Allis-Chalmers tractors.

Vicksburg District

December 13th, **Mike Harvey** of Sardis, Mississippi was low at 8 cents on 85,250 cubic yards on the west bank of the Yazoo in the Atchafalaya District.

FOR PLACING WET CONCRETE
...for loading trucks, or stock piling aggregates you'll make money with
HAISS CONVEYORS
Portable units of 20 to 60 foot length.
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1 Hardened conical point for accurate centering.
2 Heat-treated drop-forging.
3 Can be reversed to carry chain lugs.
4 Screws made of S.A.E. 1045 steel, heat-treated, 6 pitch, 5 lengths.
5 Drop-forged, heat-treated socket, reversible ratchet.
6 Wall ends for applying 1½" pipe.

YOU, who boss two-fisted jobs, watch the BECO JACK "taking up" cables or belts. *It never breaks its hold!* Observe how it gets a head-hold on those bent sections, frames, buckets, culvert ends, batch carts, wheel barrows and pulls them back into shape. *It never loses its grip!* See how easily it gets a toe-hold pushing out pins, spreading dual rims. Notice how firmly it clamps, holds, simplifies a welding job and never changes its position until its work is done. *Fits in on a thousand jobs* . . . always ready for more!

Service men, shovel men, crane men, dredge men . . . drivers of tractors, trucks or dinkies . . . these are the men who know good jacks. Give them a chance to save you time and money with a BECO. You'll find it the first tool in the kit . . . the first on every job! *A money saver every time!* Use the coupon to get complete information on the BECO Push and Pull Jack.

Unconditional Guarantee Built of drop-forged steel, heat-treated ...one of many good reasons why BECO JACKS are *unconditionally guaranteed.*

Specialty Department

BUCYRUS-ERIE COMPANY

South Milwaukee BUCYRUS ERIE Wisconsin, U. S. A.

SKY HOOKS
for use with BECO JACKS

A quick method of attaching a chain.

The BECO Sky Hook open and (dotted line) closed. Made of Chrome Nickel Steel drop-forged and heat-treated.

BUCYRUS-ERIE COMPANY
Specialty Dept., So. Milwaukee, Wis.
Send prices and complete information on BECO Jacks.
Name .....
Company .....
Address .....
City .....

For your convenience in writing to Bucyrus-Erie Company, you will find a card bound in this issue.

Shots From the Firing Line— *Continued*

Ayres & Graves of Alexandria, Louisiana secured contract for 126,000 yards on the December 1st bidding.

E. E. Morgan, Jackson, Mississippi was low bidder on approximately 184,000 cubic yards of levee work on the left bank of the Red River under the U. S. Engineer Office, Vicksburg, Mississippi. Bids were opened December 6th. Mr. Morgan's bid was 10.63. He also took 3,300 yards on the Yazoo in the Belzoni District at 33 cents.

Southern Notes

By W. W. WHORLEY

S. A. Lacy has subcontracted dragline work from Hooper Construction Company, Bunnell, Florida, on their project in Dallas County, Alabama, and is starting his Bucyrus-Erie 50-B steam dragline on this job.

R. E. Martin, Nashville, Tennessee, has begun operations on his heavy highway job in northern Alabama near Huntsville. John Dempster is superintendent on this work.

Stevens Brothers and The Miller-Hutchinson Company were low bidders on a large lock on the Tennessee River about twenty miles below Decatur, Alabama. Bids were opened at the U. S. Engineer Office, Chattanooga, and construction will be started early in January.

Colorado Notes

By H. M. BIBAUD

The El Vado Dam project, a part of the Rio Grande Reclamation project just south of the Colorado state line is now before the R. F. C. engineering department. The project when started will provide work for hundreds of men. Forty months are estimated as the time necessary for completing the job. Actual work will not be undertaken on the project before the coming spring.

The El Vado dam will be of the utmost importance to the entire southwest. Not only will it absorb surplus labor, but it will stimulate business of all kinds, especially on the Denver, Rio Grande and Western line over which the vast amount of material to be used in the construction of the dam will be transported. To facilitate the movement of material from Chama, the nearest railway station to the dam site, a fine highway has been constructed from Park View to the dam site.

The Hamilton and Gleason Construction Company was awarded the contract for five miles of highway surfacing between Leadville and Malta, on Nov. 10. Hamilton & Gleason bid $34,594.45. A. R. Mackey, the nearest competitor bid $37,705.

Pople Brothers were awarded the contract for a paving project at the South entrance to Trinidad with a bid of $27,838.00.

Final plans for the Yellow Jacket job, officially designated as Federal Aid Project 298-G, have been received at the local state highway office at Durango, and work will be started on the job in a very short time. Fifty thousand dollars have been appropriated for the project. 2.22 miles are to be graded, drained and surfaced. Following are some of the interesting figures in connection with the Yellow Jacket project: 67,500 yards of unclassified excavation; 52,500 pounds of structural steel and 656,000 tons of gravel. Albert H. Kiesel will be the resident engineer in charge of the project.

C. V. Hallenbeck Company of Denver was low bidder on four miles of highway surfacing between Dolores and Rico. The successful bid was $60,788. The bids are subject to inspection before the contracts were signed.

Logan Construction Company of Arlington with a bid of $9,808 were awarded the contract for grade widening of 4.6 miles on the Albany-Tangent Section of the Pacific Highway.

Application has been made by the Model Irrigation District for a loan of $300,000 from the Reconstruction Finance Corporation for the construction of a reservoir in Long's canyon, near Trinidad. It is the purpose of the corporation to increase the reservoir capacity of the Model project by about one-third. The present storage capacity is about 20,000 acre feet. 20,000 acres of land are now included in the project, which is on a small tributary of the Picketwire River.

C. A. Switzer of Arvada submitted the low bid of $45,333 to the U. S. Bureau of Public Roads, December 8th for construction of 3.2 miles of highway between Crawford and Sapinero, Colorado in the Gunnison National forest.

A one-half million dollar appropriation for the completion of two branches of U. S. Highway No. 40, in the vicinity of Denver will be the largest single item in the 1933 budget, if present plans of the State Highway Department are carried out. The plan calls for the abandonment of the present route of south No. 40, the Limon-Colorado Springs road, near Matheson, and then running it northeasterly to a junction with the Denver-Limon road near Riverhead. The plan would necessitate the building of overhead crossing over the Rock Island and the Union Pacific tracks west of Limon, with another overhead crossing just west of town. 28 miles of road would be constructed but due to the heavy travel, the improvement would justify the cost.

A survey of the proposed highway project east of Bayfield, which would connect the gravel east of Bayfield and the job just completed by Wood, Morgan and Company has been completed, and plans are being drawn at the local highway office. Everything will be all ready to work on the project as soon as the money has been made available.

New Mexico Notes

Lockhead & Levers of Hagerman were awarded a contract in the amount of $93,497 on EFAP 164B at letting December 14th.

Utah Notes

The State Public Utilities Commission has granted a permit to the Bingham Tunnel and Railroad Company for the construction of a railroad tunnel to serve mining properties in the Bingham District. The work will be financed by the loan from the Reconstruction Finance Corporation.

Nevada Notes

The Utah Construction Company of Ogden was awarded the contract for constructing a portion of the State Highway System in Lincoln County, between Junction Alano-Delamar Road and Caliente. The amount of the bid was $118,510.

With a bid of $66,980 J. N. Tedford of Fallon received the contract for reconstructing that portion of the State Highway System in Esmeralda and Nye Counties between Miller's Cut-Off Road and Tonopah.

Mahoney-Cline Company of Las Vegas with a bid of $112,654 was awarded the contract for reconstructing that portion of the State Highway System in White Pine County between West Foot Antelope Summit and Illipah.

Isbell Construction Company of Carson City, with a bid of $62,346, was awarded the contract for reconstructing that portion of the State Highway System in Lyon County, between Yerington and 9½ miles east.

The Utah Construction Company with a bid of $32,939 was awarded the contract for constructing that portion of the State Highway System in Elko County, between Contact and 8 miles north.

Oregon Notes

Two dollars separated the two lowest bidders on the 1.2 miles of Clackamas River-Canemah Section of the Pacific Highway. H. G. Jonhson of Portland was low at $56,524 with R. L. Houck of Independence at $56,526. As this is written the award is still pending.

General Construction Company of Seattle secured the Drinkwater Pass-Chimney Creek section of the Central Oregon Highway. This 6.37 miles of grading went for $98,521 with corrugated iron pipe.

Jacobsen-Jensen Company of Portland was awarded the contract for grading and paving 3.08 miles on the Central Point-Medford Section of the Pacific Highway. Their bid was $88,934.

Fred H. Slate of Portland was low bidder with $66,981 on the 1.04 miles of grading on the Neil Creek-Barron Creek Section of the Pacific Highway. The award is still pending.

Contractors von der Hellen & Pierson of Medford with a bid of $15,267 were awarded the contract for clearing and grubbing 4.17 and grading 1.38 miles on the McCallister Section of Little Butte Secondary Highway No. 270.

R. L. Houck of Independence was low bidder with $23,537 on the 1.22 miles of grading on the North Fork-Hatchery Creek Section of the Wilson River Highway in Tillamook County. The award is still pending.

Shots From the Firing Line— *Continued*

Washington Notes

A. O. Thorn, Strong and Grant of Springville, Utah were awarded the contract for constructing a bridge over the Meadow Valley Wash, near Caliente, in Lincoln County. Their bid was $15,806.

Contract for grading and surfacing about 3.2 miles of State Road number 8, Wind River to Collins, in Skamania County, involving about 23 acres of clearing, 193,440 cubic yards of excavation, 14,280 cubic yards of crushed stone surfacing, and other items was awarded to **Sam Orino** of Spokane for $122,298.

Norris Brothers of Burlington were awarded about 0.4 miles of State Road Number 2 on the Wenatchee River Bridge Approaches in Chelon County. The work involves about 35,790 cubic yards of excavation, 7,145 square yards of pavement and other items and was taken for $44,256.

J. H. Collins and Company of Spokane received the award for concrete paving on about 2.3 miles with two 20 foot strips and about 0.5 miles with 40 foot strip of State Road Number 2, Spokane to Dishman in Spokane County. Their bid totaled $112,786. The same company received an award for concrete paving 40 feet wide on about one mile of State Road Number 3 on Division Street in Spokane with bid of $38,413.

Queen City Construction Company of Seattle with a bid of $70,067 was awarded the contract for grading and surfacing about 1.7 miles, and paving with Portland Cement Concrete about 1.5 miles of State Road No. 5, Auburn Westerly (through Peasley Canyon) in King County, involving about 41,870 cubic yards of excavation, 3,430 cubic yards of crushed stone surfacing, 18,027 square yards of pavement, 879 cubic yards of concrete, and other items.

Dunn & Baker of Klamath Falls were low with bid of $16,290 on the 14.0 miles of pit run gravel surfacing of the Lake County Line-Silver Creek Section of the Central Oregon Highway in Harney County.

Meyers Contract Company of Portland secured 9.39 miles of grade widening on the Woodburn-Brooks Section of the Pacific Highway in Marion County with a bid of $47,826.

Clifton & Applegate of Spokane were awarded 9.85 miles of grading on the Biggs-John Day River Section of the Columbia River Highway in Sherman County. Their bid was $168,882.

Lindstrom and Feigenson of Portland were low with their bid of $28,694 for the bridge over Mary's River on the West Side of the Pacific Highway at Corvallis in Benton County.

San Francisco and Vicinity

By H. L. LIVINGSTON

Out of a total of eight bids received, the **Metropolitan Engineering Corporation** of Los Angeles was low bidder to the Metropolitan Water District of Southern California for the construction of the San Jacinto Tunnel with a bid of $7,333,315. The members of the Metropolitan Engineering Corporation are Johnson P. Porter; Charles R. Ross; George Pollock; T. E. Connolly; William S. Hanrahan and Alfred B. Swinerton. All of these men, while working as independent contractors, have a large number of very successful jobs to their credit extending over a number of years and are well known in the construction industry.

The Peninsula Paving Company, San Francisco, who bid $147,234 to the California Division of Highways for 1.3 miles of grading and paving between Waldo and Sausalito in Marin County has been awarded this contract. They are starting their operations with a Bucyrus-Erie Gas+Air shovel which will be supplemented in about 60 days by the addition of a Northwest shovel which will be released from other work.

The Hanrahan Company of San Francisco was low bidder to the California Highway Commission in the amount of $129,805 for 8.9 miles of grading and asphalt concrete paving in Tehama County. The principal items in this bid were 72,000 cubic yards of roadway excavation, 21,650 tons asphalt concrete base and 12,600 tons asphalt concrete "A" surfacing.

E. C. Coats of Sacramento has been awarded a contract by the Bureau of Public Roads for 4.5 miles of grading on the Manzanita Lake National Forest Highway in Shasta County, California. This contract was in the amount of $57,760. The largest single item of work on this job is 71,000 cubic yards of unclassified excavation.

MORE QUESTIONS—

for **Old Timers** *by* **Old Timers**

QUESTIONS and information printed in the Excavating Engineer during the past few months has lead to some very interesting further questions. Here are some questions to which many an old timer will know the answer. Send along your letters, we will be more than interested to hear from you.

1. Back in the old days Mathews Bros. of Erie, Illinois, owned a Cross back-digger which operated in both Whiteside County, Illinois and in several towns in Iowa—Lake Park, Spirit Lake, Fonda, Algona, Superior, Pocahontas, Sibley, Spencer, Wooden and Titonka. Both Mr. Mathews and Ed. Lovejoy operated this machine. If you know of any other men who operated this machine send us their names. If you know of any other men who also worked on the jobs at these towns, let us have the story.
2. Who has a copy of the old Cross Catalog? If you have one please tell us about it. If you did have one tell us when you received it.
3. It is some 25 years ago that George A. Castle of Crookston, Minnesota used a Fairbanks back-digger with a two line control on some work in Montana. If you saw this machine work or know of people who did, let us hear from you.

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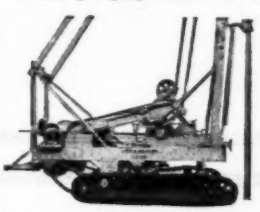
Pioneers in Drill Making

Years before churn drills were used for the purpose of drilling blast holes Loomis "Clippers" were on the job drilling for mine ventilation, sink holes, water wells, etc.

Practically every new development in churn or well drilling equipment has been a Loomis achievement.

Is it any wonder that there are more Loomis "Clipper" blast hole drills in use today and more being placed than any other make of drill?



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Will retrack wheels from either or both sides of track at once
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The One-Man outfit for pulling moving, lifting heavy loads
SAVES TIME & LABOR
NEW LOW PRICES
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For quick, lasting track repairs
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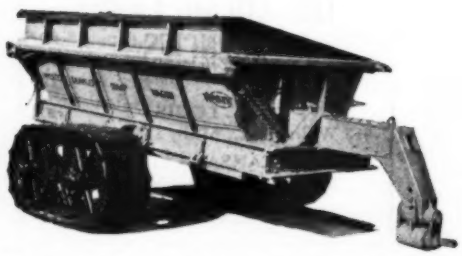
For your convenience in writing to the advertisers on this page you will find a card bound in this issue.

Western 7-8 yard Crawler wagons on Western crawler wheels working on J. E. Smith & Sons road contract near Ada, Okla.

Dependable Service Is Assured When Western Crawler Wagons are On the Job



The sturdy Western 7-8 yard wagon on Western Crawler wheels. This wagon can be equipped with a sloping top box as shown above for loading with elevating grader.

There is a satisfaction and peace of mind that you can have if Western Crawler wagons are on your job. Their rugged strength will carry them through the toughest job. You don't have to "baby" them. Just treat them right and they will do the same for you. You can depend on them, regardless of bad and changing hauling conditions. They will operate whenever and wherever your crawler tractor can operate.

There is a complete line of Western Crawler wagons in sizes that have been proved to be the most practical and economical. Only Western wagons are equipped with the Western spring windup for operating the doors. Only Western wagons are mounted on sturdy Western Crawler wheels. Send for Bulletin W-31-HK describing them all. It's yours for the asking.

Western Wheeled Scraper Company

Dump Cars and Grading Equipment

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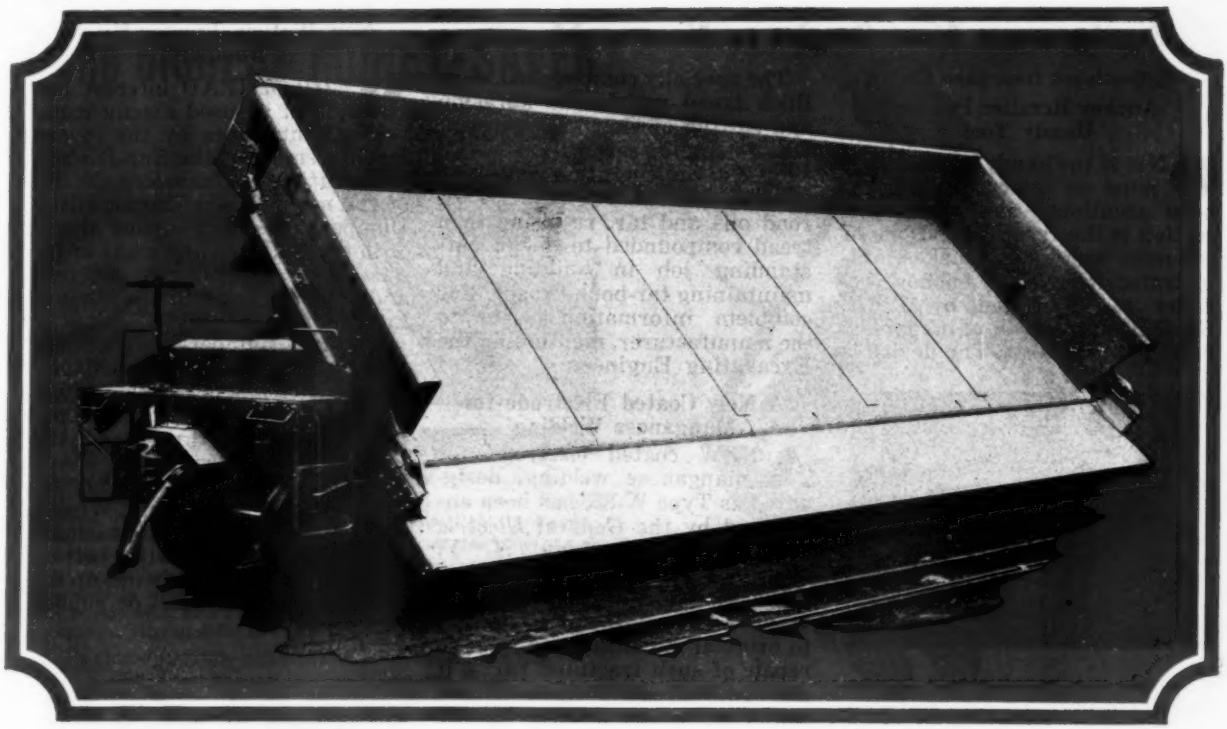
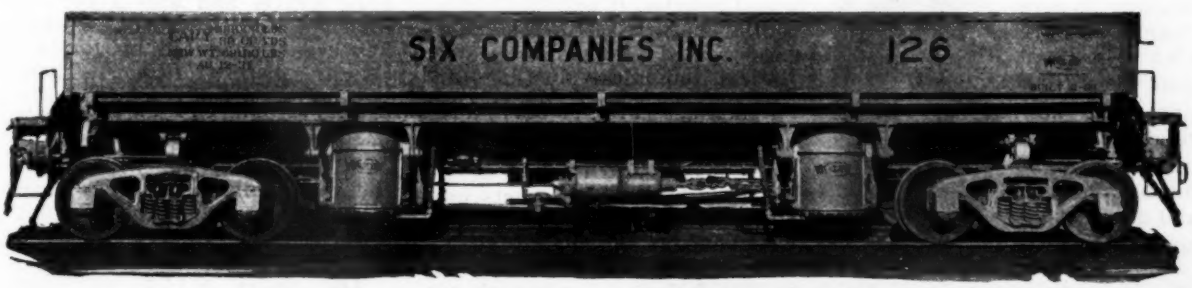


You Can Solve Your Haulage Problems With Western Dump Cars

If you expect to be among those present in 1934 you will have to "lick" your haulage problems in 1933. Western Dump Cars solve most haulage problems. They are built for that purpose. Repeat order after repeat order has been shipped to mines, quarries, mills, gravel plants, and construction projects where only the strongest, most efficient haulage equipment could answer the purpose.

Sturdy Western Dump Cars, both drop door and lift door types, are made in all sizes, both standard gauge and narrow gauge, side dump and end dump. Write for catalog 81K that describes them all.

Western Wheeled Scraper Company
AURORA, U. S. A.



WESTERN

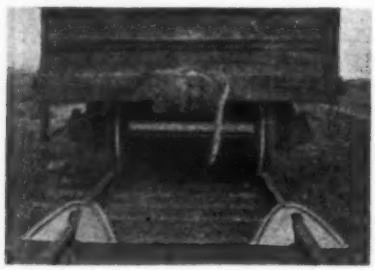
For your convenience in writing to Western Wheeled Scraper Company, you will find a card bound in this issue.

Equipment You Ought to Know About

(Continued from page 27)

Anchor Rerailer Proves Handy Tool

ONE of the handy tools around mine or quarry which has been mentioned before in this section is the rerailer, and one of the most well known makes is illustrated here, the "Anchor" rerailer manufactured by *T. H. Edelblute Company of Reynoldsville, Pennsylvania.* The device is



a simple inexpensive tool for replacement derailed cars and locomotives back on the track. It is easy to handle and the patened working feature makes it never failing. "Anchor" rerailers are made of high grade special alloy steel, a specially annealed and will stand rough usage. They are made in four sizes. For complete information write the manufacturer, mentioning this magazine.

New Tractor-Grader Tire

THE Tractor-Grader tire, companion to the Zero Pressure tire has recently been announced by the B. F. Goodrich Company, Akron, Ohio. This new pneumatic product is of the lug-type, built for road service, constructed for hard knocks and severe driving torque. Tread design is self cleaning, to give clean, positive sharp-edged gear wheel traction. The herringbone design insures straight forward motion and does not allow side-creep.

Tractor service demands a tire carcass of unusual strength. The severe action of driving torque was given particular attention in the design of carcass.

The specially compounded, very thick tread resists the abrasion and cutting of sharp stones common to tractor service.

Special consideration was given to the destructive qualities of road oils and tar, resulting in a tread compounded to do an outstanding job in building and maintaining tar-bound roads. For complete information write to the manufacturer, mentioning the Excavating Engineer.

A New Coated Electrode for Manganese Welding

A NEW coated electrode for manganese welding, designated as Type W-85, has been announced by the *General Electric Company, Schenectady, N. Y.* This new wire finds its principal application in the building up of worn manganese steel castings to original dimensions and in the repair of such fractured parts. It also can be readily applied to obtain a manganese steel surface on parts of ordinary steel and iron, thereby giving the parts a tough, work-hardening, wearing surface at a low cost. Other applications will be found in worn equipment. Considerable saving is possible through reclaiming instead of scrapping, dipper teeth, crusher mandrels, and all pulverizer parts, as well as worn parts of numerous items of equipment used in the excavating fields. In addition, this new electrode should be of great interest to the traction industry for building up worn switches, frogs, and crossovers.

The new electrode has several outstanding features, among which are the following: 1. Reliable welds can be made by relatively unskilled operators. 2. When the rod is melted in the atmosphere and applied to ferrous metal articles, it exhibits the essential characteristics of standard heat-treated manganese steel, that is, toughness, ductility, and surface hardening under cold working. The nickel content overcomes any tendency of the metallic manganese content of the rod to oxidize and prevents brittleness under slow cooling. 3. No quenching of the weld-metal is necessary. The nickel successfully "carries" the relatively high carbon without effecting the ease of welding and the high carbon, in turn, gives excellent wearing qualities to the weld.

New Watson Tractor Hitch Dumper

WIDESPREAD interest has been aroused among excavating contractors by the recent announcement of the *Rex-Watson Corporation of Canastota, N. Y.*, of the new Watson Tractor Hitch Dumper. This unit is used singly or in tandem with any make of industrial or track-laying tractors and can be quickly hitched or unhitched.

The new dumper is a development of the well-known bottom-dumping Watson wagon which for years made an enviable reputation for itself throughout the world. The bodies are of heavy hardwood lumber, thoroughly reinforced with steel plates. Wheels are mounted on Timken bearings. They are equipped with bottom dumps and automatic wind-up device; with either steel or rubber

tires. Running in a continuous circle from the shovel to and over the dump and back again, it is claimed that they will revolutionize present day haulage costs. Complete specifications will gladly be sent by the manufacturer. Please mention Excavating Engineer when writing.

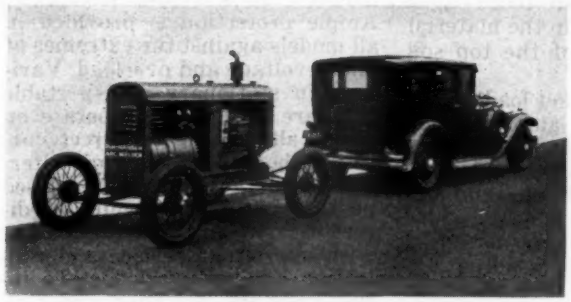
New Portable Screening and Crushing Plant Announced

A NEW crushing plant designed to work in conjunction with a standard bucket loaded with vibrating screen, providing sized gravel and also a certain percentage of crushed material has been announced by *Barber-Greene, Aurora, Illinois.* These two units form a complete excavating, screening, crushing and loading plant. It is self propelled and portable. This will enable the road builder to utilize local pits when specifications permit bank run materials to be used, thus greatly reducing costs.

The loader with vibrating screen is a complete unit in itself, having its own gasoline engine which drives the crawlers as well

(Continued on page 44)

"The BIGGEST MONEY-SAVER



I ever had" ..

That's the way one contractor talks about his P & H - Hansen Electric Arc Welder. For repair work and for a thousand jobs around any construction project, this handy welder pays for itself in short order. And the beauty of it is: it's so easy to operate. Easy to strike an arc, easy to hold one, even with inexperienced operators. Steady current flow, light in weight, compact, weather-proof, and low cost: that's the P & H - Hansen in a nutshell. Write today for valuable new bulletin: "Weld it Well".

HARNISCHFEGER CORPORATION · Established 1884
4517 West National Avenue, Milwaukee, Wis.

P&H-HANSEN ARC WELDER

AMERICA'S FINEST FASTEST WELDER

No Jacks Are Used on this Track Raising Job

Raising track is only one of the uses to which the Track Machine can be put. In addition to raising track vertically, it will also shift track laterally, from 18 to 36 inches being attained at a single shift. On waste dumps, on fills, in quarries and open pit mines, in fact wherever track must be raised and shifted and a track gang is maintained, this machine is a time and money saver. Why continue with old-time hand methods for which machinery is now available?

NORDBERG MFG. CO., Milwaukee, Wis.

THE NORDBERG PATENTED
TRACK SHIFTER

Give your crane this "hand" .. *and increase its payloads*

The Williams "Champion" bucket will increase the output of any crane. It is smooth and powerful in operation, making every minute count.

The exclusive power-arm combination of lever and block-and-tackle not only gives increased digging power but also unusually quick action because of reduced cable overhaul. Straight cable lead reduces cable wear and replacements.

Buy a Williams "Champion" NOW and get the most out of your crane equipment. *Write for latest bulletin.*

WILLIAMS
• BUCKETS •

THE *"Champion"* DIGGERS

Power-Arm, Multiple-Rope, and Dragline Buckets — "Arch-Girder" Trailers

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(Continued from page 42)
as the buckets and screen. The crushing plant is towed behind the loader and has its own engine which drives the crusher and the conveyors. For complete information write Barber-Greene Company, mentioning this magazine.

Haiss Loaders Now Have Improved Feeding Device

WHILE the Haiss Company's liberal use of manganese steel has given their loaders an uncommon wear resistance, improvements are still being introduced. The revolving paddle feeding device which was originated by Haiss and is characteristic of Haiss loader design, has been further improved, according to a recent announcement of *George Haiss Manufacturing Company, 144th Street and Park Avenue, New York, N. Y.* The paddle tips inevitably wear off, notwithstanding the abrasion resistance of their heavy manganese steel construction. The Company is now equipping machines with new form paddles in which a renewable tip is an integral part of the design. As will be seen from the illustration, these separable paddle tips are not only renewable but are reversible, so that when the original outer edge is worn down, the tip piece may be reversed and a new unworn edge brought into play.

The illustration shows these renewable paddle tips in two forms. The upper picture illustrates the smooth-edged design used for crushed stone, gravel, etc. The serrated-edge paddle is for top soil, where the square-tooth edges pulverize and fluff up the material to the advantage of the top soil contractor.

The portable bucket loaders has many champions among truck fleet operators as a most economical means of digging and loading piled crushed stone, sand and gravel. In many parts of the country such machines are also used for excavating and loading top soil where this is a marketable commodity.

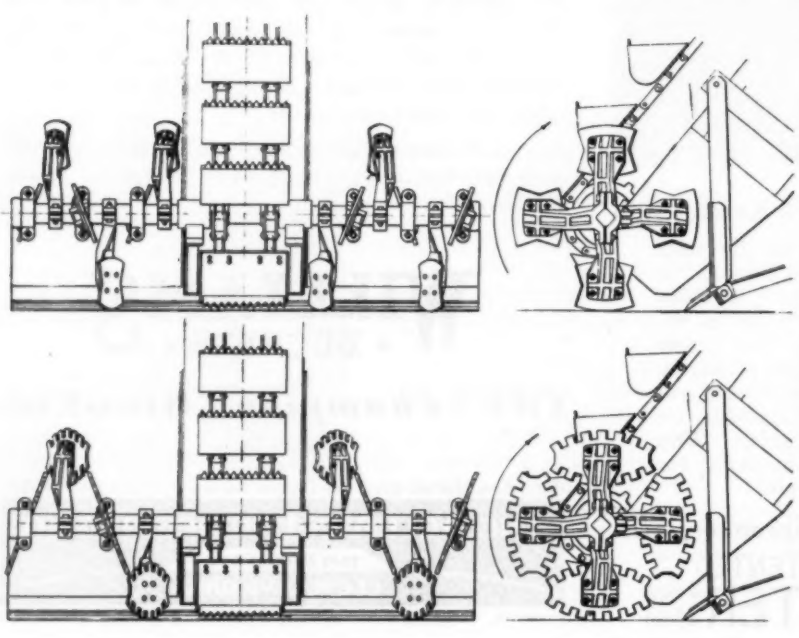
For complete information write the manufacturer, mentioning this magazine, please.

P&H Hansen Welders Improved

AMONG the improvements recently made to their line of P&H Hansen arc welders, *Harnischfeger Corporation, 4517 W. National Avenue, Milwaukee, Wisconsin,* has added these:

To extend the welding range and to further improve arc recovery and arc stability, a new magnetic bridge and a unique short circuit winding are included on later models; a new dead front control cabinet adds to the general appearance and further simplifies the design; units up to 300 ampere size have the motor and generator mounted as a single unit to form a compact two bearing machine.

The large size (P&H arc welders are made in 100, 200, 300, 400, 600 and 800 ampere size) are four bearing units, the generator and motor being direct coupled and mounted on a welded steel base. Ample protection is provided in all models against the extremes of under voltage and overload. Variants in stationary and portable type are designed to operate on either alternating or direct current. Those operating on alternating current have an enclosed push bottom starter while the direct current units have a starter with no voltage release and protection against overloads. To insure constant operation under all conditions the P&H arc welders are made dust proof and moisture proof. For complete information write the manufacturer, mentioning this magazine.



Sterling Enters Diesel-Powered Truck Field

STERLING Motor Truck Company has announced thirteen heavy duty truck models powered by Diesel. The first regular production models are now under construction at the factory at Milwaukee. A number of the larger units are already sold and will go into immediate service.

The new Diesel-powered models range in capacity from 4 tons upwards and are designed for all types of heavy duty service such as roadbuilding and excavation work. As a result of Sterling's extensive special chain drive patented features, they will be able to offer exclusive types of chain drive Diesel-powerd models in addition to the conventional type of enclosed rear drive.

The manufacturer claims gruelling tests have determined that fuel costs can be reduced from 60 to 75% by the use of Diesel engines. Other economies are also effected in the use of Diesel through the elimination of the electrical equipment, as the Diesel engine gets its ignition from compressed air instead of the regular spark plug system. In addition, this new type of engine develops greater lugging power than comparable gasoline motors and fire hazards are eliminated. Sterling officials believe that as these facts become known to truck operators generally there will be a rapid swing to the use of Diesel-powered trucks. For additional information write the *Sterling Motor Truck Company, Milwaukee, Wisconsin,* mentioning Excavating Engineer.

Profits within reach!

WHEN old methods and old equipment can no longer produce profits at competitive prices it is time to investigate new methods. For material handling savings look to Loadmaster. A small investment puts this handy utility crane on your job. Lowered costs quickly pay for it. Compact and fast moving, it gives prompt lifting service wherever you need it. In addition it hauls trailers or carries a suspended load. Special equipment may be added to increase its savings of time and money. Investigate Loadmaster—send the coupon today.

BUCYRUS ERIE LOADMASTER

BUCYRUS-ERIE COMPANY
South Milwaukee, Wis.

Please tell us more about the Loadmaster and how it can save money in our material handling.

Name _____

Firm _____

Address _____

City _____

Business _____

New Troy-Menands Bridge

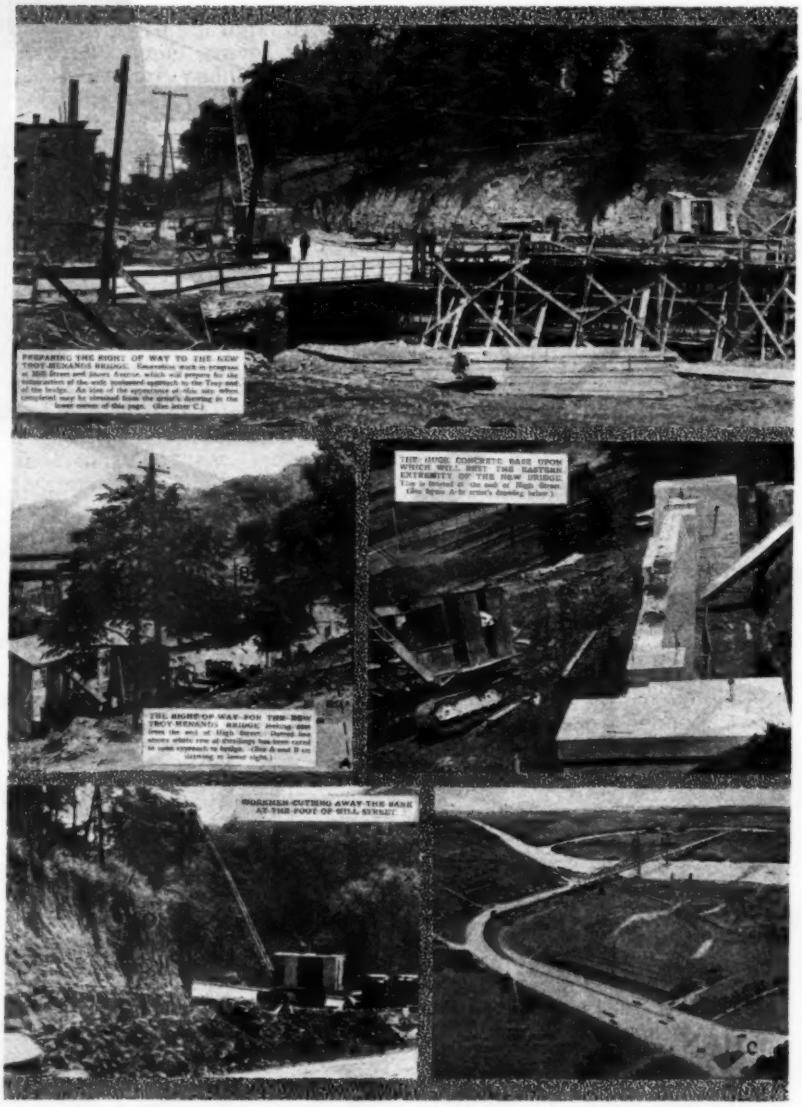
(Continued from page 16)

on each end of the bridge, which will serve as storehouses and quarters for the bridge attendants. Traffic on the approaches will be protected by concrete balustrades and cable guide railings.

T. F. Fitzgerald is President of the Fitzgerald Brothers Construction Company, Incorporated, and E. S. Fitzgerald is Secretary and General Superintendent and was in direct charge of the work, in which he was ably assisted by R. J. Carignan. The operators on the two Gas+Air shovels were R. Rickerson and Lloyd Martin, and the Gas+Air crane was operated by C. Gageway. S. Whitehead was the Engineer in Charge for the State of New York.

The contract for the steel superstructure was handled by the Phoenix Bridge Company of Phoenixville, Pennsylvania.

The approach contract cannot be completed this year because of the depth of fill which must be allowed to settle over the winter. At the present writing the fills, retaining walls, concrete bridge and temporary pavement to carry the traffic over the new area has been completed, but the permanent paving of the approaches cannot be done until 1933.



PREPARING THE RIGHT OF WAY TO THE NEW TROY-MENANDS BRIDGE. Excavation work in progress at Hill Street and Jones Avenue, which will prepare for the construction of the only boulevard approach to the Troy end of the bridge. An idea of the appearance of this new when completed may be obtained from the artist's drawing in the lower center of this page. (See letter C.)

THE HIGH CONCRETE BASE UPON WHICH WILL REST THE EASTERN EXTREMITY OF THE NEW BRIDGE. Top is located at the end of High Street. (See figure A-B on artist's drawing below.)

THE RIGHT-OF-WAY FOR THE NEW TROY-MENANDS BRIDGE. Looking east from the end of High Street. Dotted line shows artistic view of driveway to be carried to open approach to bridge. (See A and B on drawing at lower right.)

WORKMEN CUTTING AWAY THE BANK AT THE FOOT OF HILL STREET.

C

Rival to Old Faithful

THIS interesting snap shot shows the firing of a blast in sand rock on Wisconsin Highway 71 near Norwalk. The holes were shallow and this, in combination with the nature of the material, causes a geyser-like explosion though a good breakage is secured. As a large number of the shallow holes are required the working of this cut is quite spectacular. P. W. Ryan Sons of Janesville are the contractors. Powder used is Burton 40% gelatin. The compressor shown is a Gardner Denver 358-cubic-foot size, the shovel a Bucyrus-Erie 37-B, the grade at the left a Caterpillar 12-foot blade.

Excavation for 1933 Highway Construction with summary 1932 roadbuilding

(Continued from page 15)

yards of excavation while the reconstruction required 3,000,000 cubic yards. There was also 63 miles of paving and 494 miles of gravel surfacing applied. About 3,000,000 cubic yards of excavation on old contracts is carried over into 1933. Nebraska has already made full use of all available Federal Relief funds for highway construction.

Because of uncertainty as to Federal and State funds which will be available, no estimate of value can be made for 1933 construction at this time.

Nevada

Federal Aid projects completed by the Department of Highways, State of Nevada, during 1932 included reconstruction with gravel surface of 112.36 miles costing $792,189 and involving 1,435,393 cubic yards of excavation; asphaltic concrete paving of 13.72 miles costing $366,026 and involving 245,784 cubic yards of excavation; gravel surfacing of 14.76 miles costing $23,532; applying bituminous wearing surface to 11.70 miles at a cost of $20,502; applying road mix bituminous surface to 134.35 costing $270,715; and the construction of four bridges of reinforced concrete costing $133,541.

Emergency construction projects completed in 1932 include reconstruction with gravel surface of 13.62 miles costing $80,442 and involving 127,296 cubic yards of excavation.

Projects financed with Federal Lands Funds completed in 1932 included application of bituminous wearing surface to 11.01 miles at a cost of $19,308.

Snow removal is a real maintenance problem involving a considerable slice of the highway funds in many northern states. Here is a Caterpillar Auto Patrol equipped with a V-type plow clearing 16 inches of hard packed snow from highways in Beaverhead County, Montana. This hard snow could carry the weight of two men without breaking the crust.

State Aid projects completed during 1932 included new construction with gravel surface on 13.52 miles costing $65,973 and involving excavation of 89,886 cubic yards. Road mix bituminous surface was applied on 9.59 miles of State Aid at a cost of $17,829.

In addition to these projects which were completed contracts were made during 1932 on the following projects, completion of which will be carried over into 1933. Federal Aid application of road mix bituminous surface on 50.94 miles to cost $100,485.

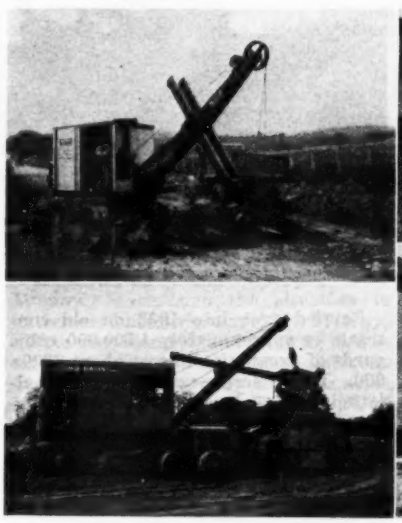
Emergency construction projects, reconstruction and surface with plant mix cutback asphalt of 14.73 miles to cost $280,681 and which will involve excavation of 336,130 cubic yards. Reconstruction with gravel surface of 28.49 miles to cost $201,578. Reconstruction to grade and drain only 12.62 miles to cost $123,920. For new construction to grade and drain only 7.98 miles to cost $36,232. The yardage involved totals 539,953 cubic yards. There is also in the Emergency construction projects underway one steel bridge to cost $40,197.

Projects financed with Federal Lands and State Funds under way include: new construction with gravel surface of 62.61 miles to cost $371,531; steel bridge to cost $17,387. The excavation involved is 737,953 cubic yards.

Nevada expects to place under contract immediately after January 1st and to complete before June 30th the following additional projects:

Cement concrete pavement — 6.34 miles, estimated cost $375,000.
Asphaltic concrete pavement—5.42 miles, estimated cost $150,000.
Reconstruction — gravel surface,

View taken from top of heading of deep cut for County Highway No. 1927, Sullivan County, N. Y., looking down through cut. Maximum depth through rock, 65 feet. Slope of rock sides to be 1 to 1. Length of cut 1700 feet. 137,000 cubic yards rock and earth to be excavated. Overburden about 15%; bluestone about 65%; red shale about 20%. Vertical curve of 1,000 foot radius at high point of cut. Contractor Owen P. Williams Construction Company, Inc., Oneonta, New York.



Above, left: Lane Construction Company of Meridan, Connecticut build a lot of road each year in and around New England. This machine of theirs (one of the new Bucyrus-Erie 16-Bs) is showing you some pretties in the way of shallow but close grading on reconstruction on the Middletown-Montgomery New York State Highway. Superintendent Paul D. Henson is in charge. Above, right: Callan Construction Company of Bristol, Rhode Island did some pretty shovel grading in this clay and shale for a grade crossing elimination at Van Etten, New York. T. J. Foley was Superintendent. Below, left: On the Grand Central Parkway job near Mineola, Long Island, Contractor Cloyd Davis, Inc., hauled his dirt with Watson Tractor Hitch Dumpers. The job totalled 300,000 yards and though Mr. Davis was the last contractor to start he was first to finish and attributes his splendid results to the Watson "tractor hitch." In commenting on the economy of these units Mr. Davis mentions elimination of truck license and insurance and low maintenace. He continues, "We have operated these units in fair weather and foul, in sand and mud, and they will pull right through everything. The ones with Zero Pressure tires lowered our gasoline consumption on the tractor from 18 to 11 gallons per day." The shovel illustrated is a Speeder. Below, right: Here's a city street job . . . a Gas+Air owned by Brugel Contracting Company tearing up old pavement in Ridgewood, New York.

14.27 miles, estimated cost $85,620.
New construction—gravel surface, 20 miles, estimated cost $100,000.
Road mix Bituminous surface—22.58 miles, estimated cost $60,000.
The plans are not sufficiently advanced to furnish the yardage of excavation involved.

15 miles of gravel surface will also be placed under contract on or about January 1st and the cost of $90,000 paid from the Federal Lands and State funds.

In addition to this 1933 work outlined above Nevada Highway Construction program for 1933 provided Federal Aid funds made available will probably include the following:

Reconstruction—gravel surface—50.51 miles, estimated cost $277,460.
Road Mix bituminous surface—152.75 miles, estimated cost $427,695.
Surface with gravel only—20.6 miles, estimated cost $45,320.
New construction—gravel surface, 20.13 miles, estimated cost $110,780, 1 reinforced concrete bridge estimated cost $15,000.

Whether or not there will be an increase of highway construction in this state in 1933 over 1932 depends entirely upon the amount of Federal Aid appropriation made available by Congress. At the present writing it appears that Congress is determined to reduce Federal Aid to the minimum and in the event Federal Aid is discontinued entirely it would prove disastrous to this State insofar as highway construction or reconstruction is concerned. The present revenue for highway purposes amounts to barely enough to take care of maintenance.

New Hampshire

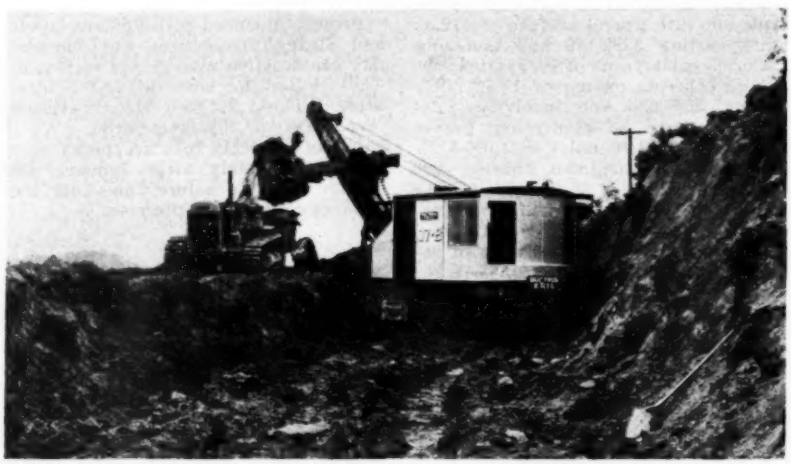
In 1932 New Hampshire graded for new roads only 1.36 miles at cost (from Emergency Relief funds) of $5,500. Reconstruction with Federal Aid totaled 17.76 miles costing $660,000; with Emergency Federal Relief, 14.89 miles at cost of $505,000; with State Funds, 22.11 miles at $577,000; while on local roads 158 miles were reconstructed at cost of $949,600. Excavation for these various items totaled about 1,264,500 cubic yards. Paving on 20.1 miles cost $391,000 and gravel on 182.66 cost $465,000.

Here's a machine for shouldering built by the Whitcomb Locomotive Company. It picks up the surplus dirt and loads it to trucks. This Whitcomb shoulder finisher is working for the State Highway Commission down in South Carolina.

New Hampshire is carrying over into 1933, 25,000 yards of excavation on uncompleted contracts to cost $10,000. In addition there is available for use before July 1st $223,000 of Emergency Relief funds which will probably be used in moving 400,000 cubic yards of excavation for highway construction. It is probable the state and local construction for 1933 will total about $2,500,000.

New Jersey

Highway construction for 1932 on Federal Aid projects totaled 9.9 miles of grading costing $116,323; on Emergency Federal Relief projects, 45.2 miles costing $1,291,998; and on state road projects, 7.3 miles costing $201,667. In addition New Jersey widened 21 miles of State roads at an expense of $57,752. The 62.4 miles of new construction required 2,754,108 cubic yards of excavation while the 21 miles of widening required 43,813 cubic yards. New Jersey paved 38 miles at a cost of $1,200,000.



The going is a bit rough and P. W. Ryan Sons of Janesville, Wisconsin, believe in putting on a full load—but the cat-skinner doesn't worry about that.

Carried over into 1933 on old contracts is approximately 1,500,000 cubic yards of excavation to cost about $300,000. The Emergency Relief funds allotted to New Jersey for highway construction amounted to $1,657,733 which has all been used or assigned to contracts now underway. In 1932 New Jersey also received $555,329 of normal Federal Aid. The amount of new work in 1933 is dependent upon what Federal appropriations are made and also on the State funds made available. While there is no way of arriving at these figures at the present time, should approximately $6,000,000 be available for new construction it is probable that $3,900,000 would go into grading and surfacing of 44.8 miles of new roads, about $10,000 to widening of one mile of existing road, and about $2,000,000 to the paving of 68 miles.

New Mexico

Grading and other construction for new roads in the State of New Mexico for 1932 including phase construction on previously built projects, according to R. W. Bennett, Engineer of Statistics, approximates a total of 415 miles at a cost of $3,280,729. Of this construction 384.6 miles was built from Federal Aid and Emergency Federal Relief funds while the strictly state projects were 30.4 miles costing $175,636. This work involved approximately 5,000,000 cubic yards of excavation. New Mexico paved in 1932 11.06 miles at a cost of $287,822 and graveled 166.195 miles at a cost of $1,871,870.

For 1933 New Mexico still has available $1,300,000 which must be used, according to the provisions of the Emergency Federal Relief appropriations, before July 1st. It is expected that this will be used in grading 104.2 miles of highway involving excavation of 1,300,000 cubic yards. With limited funds now in sight there will probably be little construction in 1933 except this carry-over work of the Emergency Federal Relief program and the matching Federal Aid funds. No definite highway program for 1933 can be formulated until after the legislature in March but it is probable that New Mexico will show a 50% decrease in highway construction.

New York

The amount of funds which will be made available for construction and reconstruction during the 1933 season have not as yet been determined by the legislature. It convenes on January 1st and until such time as appropriations have been made, it will be entirely impracticable to make any estimate of the amount of work which will be done during 1933.

North Carolina

North Carolina expects to show an increase of 75% in highway construction for 1933, according to L. R. Ames, State Highway Engineer.

1932 Federal Aid funds and Emergency Federal Relief provided for 182 miles of new grading at a cost of $1,380,038. In addition there was 11.1 miles of reconstruction costing $10,000. Grading on county roads totaled 20 miles at a cost of $140,000. It is estimated

Where his trucks couldn't go Ray Strawser put his Caterpillar Fifties and 8-yard Athey wagons in this wet 27-foot cut for a creek channel. The job eliminates two dangerous grade crossings across the Pennsylvania R. R. on State Highway 127 south of Eaton, Ohio. Mr. Strawser made average daily output here with this Bucyrus-Erie 1¼ yard Gas+Air of 1400 yards. Length of haul was 1000 feet.

that the work on new roads required 3,000,000 cubic yards of excavation and that on reconstruction 10,000 cubic yards. North Carolina paved 45 miles at a cost of $521,000, graveled with topsoil 25 miles at a cost of $250,000, surface treatment and sand-asphalt mixed-in-place on 320 miles cost $1,200,000.

Carried over into 1933 on old contracts is excavation of 2,000,000 cubic yards costing $42,000. In addition there is still available $1,600,000 of Emergency Federal Relief funds to be used before July 1, 1933. It will probably be used on work requiring 300,000 cubic yards of excavation.

Additional work in 1933 is expected to involve the grading of 200 miles of new road at a cost of $1,400,000; paving of 130 miles to cost $1,000,000; topsoil surfacing of 100 miles to cost $600,000; and surface treatment of 362 miles to cost $1,318,500. It is estimated that the total excavation required during 1933 will run approximately 3,500,000 cubic yards. About 60% of this work will be suitable for power shovel or dragline operation.

North Dakota

Through the courtesy of J. N. Roherty, Design and Research Engineer of the State Highway Department, we are advised that North Dakota highway expenditures for 1932 totaled $1,304,674 from Federal Aid funds; $423,015 from Emergency Federal Relief funds; and $869,910 from State funds, making a total of $2,597,601. Of this sum approximately half was used for grading and about half for surfacing, graveling and oiling. Excavation for 1932 will probably total about 6,000,000 cubic yards. 8 miles of highway was paved at a cost of $230,000 and 850 miles received gravel and oil mixed surfacing at a cost of $1,275,000.

About 6,000,000 cubic yards of excavation to cost $1,000,000 is being carried over into 1933 on old contracts. North Dakota has used her entire allotment of Emergency Federal Relief highway funds. Threatened diversion of highway funds makes it difficult to prepare an estimate at this time of the new work to be carried on during 1933. Mr. Roherty hazards his own guess, however, that North Dakota's highway construction will probably show a decrease of about 50%. On this basis it is probable that about 250 miles of highway will be graded at a cost of some $600,000 and about 250 miles surfaced with gravel or oil-mix at a cost of around $400,000. In addition there will probably be about 30 miles of reconstruction to cost about $90,000. The total excavation involved on new roads will probably run about 4,000,000 cubic yards and that on reconstruction about 600,000 cubic yards.

Ohio

Grading of new roads in Ohio for 1932 totaled about 531 miles at an estimated cost of $15,932,000. Reconstruction on 270 miles cost $5,400,000. Paving of 640 miles cost $17,105,000 and graveling on 10 miles cost $30,000. Excavation on the 531 miles of new grading totaled 2,655,000 cubic yards while that on the 270 miles of reconstruction amount to 337,500 cubic yards. The carry-over on old contracts into 1933 amounts to 500,000 cubic yards of excavation costing some 37 to 81 cents per cubic yard. Ohio still has available in the Emergency Federal Relief funds $727,635 which must be spent before July 1, 1933. This money will undoubtedly be used and will probably provide for excavation of some 200,000 cubic yards.

The program of additional work for 1933 is very uncertain at this time. Should the legislature, which meets early in January, decide not to defer any of the normal highway funds to other channels the Department of Highways expects to have a program similar to that for 1932 outlined above both as to expenditures and type of work.

However, as summed up by Earl V. Murray, Statistician the situation is extremely uncertain. Says, Mr. Murray, "With considerable and varying sentiments now prevailing among different groups who believe they have the solution to many of our economic ills, all of which have the prospects of affecting our funds, it is difficult now to forecast the extent or type of work to be undertaken next year by the Department."

Oklahoma

No reply received to letters and telegrams.

Oregon

Oregon State Highway Department wires that the information regarding construction for 1932 and a forecast for 1933 cannot be furnished for several weeks.

Pennsylvania

Chief Engineer Samuel Eckels of the Department of Highways wires that Pennsylvania completed during the past year 362 miles of pavement by contract and 2713 miles by department forces. In addition 2325 miles are now under construction, about 300 miles of which is by contract. There is nothing definite on the 1933 program at this time as this depends entirely upon the action of the legislature.

It will be remembered that Pennsylvania has been working this year on their new program for lifting the farmer out of the mud. In the spring of 1931 80,000 miles of Pennsylvania roads were the responsibility of the townships against 13,425 miles in charge of the state. Pennsylvania had been building her main arterial highways at a cost of from $50,000 to $70,000 a mile and was spending as much as $85,000,000 a year to build them. Mr. Pinchot ran for governor in 1930 on a platform which called in one of its principal planks for taking over by the state of about 20,000 miles of the rural roads which were to be transformed into dustless, mudless hard surface thoroughfares, good every day in the year. The people approved the proposal, elected Mr. Pinchot and a legislature that, without a dissent vote, transferred 20,000 miles of dirt road from counties and townships to the state system.

Columbia Power & Investment Company of Stevenson, Washington, built this State Highway west of Walla Walla. The Caterpillar Diesel in front with the 7-yard LeTourneau scraper handled 400 yards each 8-hour shift on an average 750-foot haul and with fuel consumption of 26 gallons per shift. Below: "Oil-Mix" is meeting the demand for an economical surfacing on many highway programs. Here we see a No. 9 Caterpillar Auto Patrol in Snohomish County, Washington, mixing oil surfacing on a newly opened cutoff from Arlington to the Pacific Highway.

A study was made of cheap roads for light traffic and it was found that where old roadbeds had adequate bases, they could put on a layer of broken stone aggregate, treat it with a bituminous binder, at a cost ranging from $1,500 to $2,500 a mile. This would give a satisfactory surface which could be built upon as it tended to break down and would improve with the years. A maximum per mile on rural roads was set at $6,000 and it was often found possible to cut $1,000 from this figure. The $6,000 provides a roadbed that is twenty feet wide. Clearing out, widening

and easing of curves and grades was provided for with careful attention given to drainage. In the center of the twenty foot width is built a road fourteen to sixteen feet wide. Base material is put down in varied degrees of thickness depending on the need. Generally a broken stone base 5 inches thick is laid and thoroughly compacted by a steam roller before adding a three to four inch application of finer material, usually ¾ inch stone. To this a final bituminous binding material is applied with a second application later where necessary with a sprinkling of stone chips to form a non-skid surface. Additional surface courses are added to carry heavy traffic as the necessity arises.

In September 1932 the Highway Department had 40,000 men at work. 34,000 miles of Pennsylvania highways are now under care of the state.

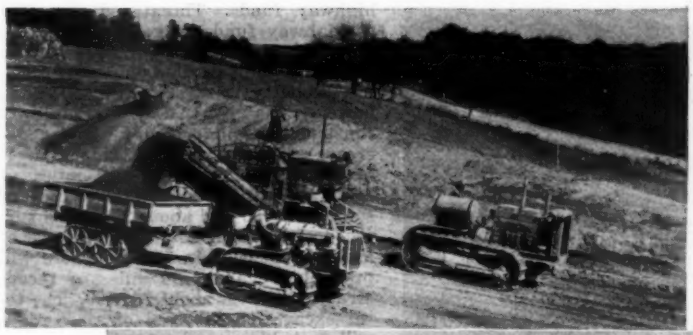
Rhode Island

At the end of the year Chief Engineer G. H. Henderson of the Rhode Island State Board of Public Roads, had under contract approximately 27 miles of construction and reconstruction on Federal Aid projects, of which 22 miles are reconstruction and five new construction. On state projects there will be five miles of new construction under way.

Loading rock for retaining walls along their section of the Ranier National Park Highway was one of the jobs assigned to this Bucyrus-Erie 20-B Diesel by contractors Holmberg & Norman. Two of these walls requiring 6700 cubic yards of rock brought this contractor $11 per yard. Photo courtesy Pacific Builder and Engineer.

Most of the above projects are now under contract and considerable work on them has been performed. There is involved a total of approximately 194,000 yards of excavation remaining to be performed in the reconstruction contracts and 168,000 yards in the new construction projects.

All of the above projects will be completed on or before August 1, 1933. Also, the above projects use up all regular Federal Aid and Emergency Federal Aid now available and State funds available until the fall of 1933. In other words, the State Board of Public Works does not anticipate the award of additional contracts until the fall of 1933 because of lack of funds in the General Highway Fund. Beginning in the fall of 1933 they anticipate awarding contracts for construction and reconstruction on Federal Aid and state projects to the extent that funds will permit.



Above: J. R. McLean handled this job of road grading on Wisconsin 35 near Somerset. The Caterpillar elevating grader pulled by a Caterpillar Diesel loads to Athey Truss wheel wagons hauled by Caterpillar Thirtys. Below: Greenlake County, Wisconsin, uses this Western Wheeled Scraper No. 100 crushing plant for preparing surfacing for Greenlake County roads. In one day of 8½ hours it turned out 576 yards of ¾ inch stone with 55 or 60 percent passing through the crushers. Similar plants are operated in Texas by the Trinity Farm Gravel Company, Warren Spear, and Davies & Sons.

Appropriation for construction and reconstruction for the fiscal year ending June 30, 1933, was $1,271,000. The budget for the fiscal year ending June 30, 1934, for construction and reconstruction, asks for $2,100,000. If this budget be passed by the incoming Legislature, it will enable the State Board of Public Works to contract for considerable construction and reconstruction commencing next fall. While no definite program has as yet been approved, it is reasonably safe to assume that the excavation involved in the contracts which will be awarded will approximate 400,000 cubic yards.

South Carolina

Chas. H. Moorefield, State Highway Engineer of the Highway Department gives us the following summary of the construction and maintenance activities of the State Highway Department for the year ending September 30, 1932.

Construction Expend. ---$9,374,362
Maintenance Expend.---- 1,314,384

Construction work completed during the year:

Concrete Pavement ---	266.1 miles
Bituminous Surfacing -	216.6 miles
Earth Types ----------	177.7 miles
Number Bridges -------	109

Status of System as of September 30, 1932:

Completed

Standard Pavement ---	2,380.4 miles
Bituminous Surfacing	796.2 miles
Earth Types (Imp.)---	1,662.0 miles
Total ----------	4,838.6 miles

Under Construction

Bituminous Surfacing-	337.7 miles
Earth Types (Imp.)--	28.8 miles
Total ----------	366.5 miles
Unimproved --------	758.7 miles
Total State Highway System ----------	5,963.8 miles

No very definite forecast of South Carolina's program for 1933 can be made at this time. No state funds have been available for new construction since the beginning of 1932. However, construction contracts, involving approximately $2,500,000 have been awarded since August 31, 1932, from funds provided by the Federal Emergency Relief and Construction Act of 1932 supplemented by our share of the regular Federal Aid apportionment. This work is known as the Emergency Program and includes the following projects.

Concrete Pavement ----	13 miles
Bituminous Surfacing --	244 miles
Top-soil and Sand Clay--	20 miles
Bridges ----------	2077 feet

"Boy, mah boss is so spendthrifty he lights his cigarettes wif a ten dollah bill."

"Huh! Dat's nothin! Mah boss washes his feet wif Gold Dust!"

South Dakota

The prospects for road construction during 1933 are not very encouraging. There are movements on foot to divert present Highway revenues to other channels and it is doubtful whether or not there will be any State construction funds available in 1933.

In 1932 South Dakota graded 134.32 miles of new road at a cost of $468,175 and reconstructed 119.98 miles costing $299,054. Excavation for the new grading totaled 2,715,300 yards and on the reconstruction 1,838,700 yards. 46 miles was paved at cost of $1,058,000 and 360 miles graveled at an expense of $396,000.

About 480,000 cubic yards of excavation are carried into 1933 on existing contracts and will cost around $75,000. In addition there is still available $72,000 in Emergency Relief funds and use of these funds before July 1st, 1933 will involve excavation of 1,500,000 yards.

Tennessee

Until after Congress and the State Legislature make the appropriations for 1933 it is impossible to make any authentic forecast of road construction.

Texas

The Texas Highway Department ends its fiscal year on August 31st. For the period ending August 31st, 1932 work on highways involved 1,253.35 miles of original construction and 1,051.79 miles of stage construction. The total mileage of 2,305.14 cost $24,693,519. Principal divisions were 1,095 miles of grading costing $7,037,837 and 689 miles of reinforced concrete paving costing $13,377,697. Bridges and grade separations cost an additional $3,875,235 not included in above figures. Of the grand total of slightly over twenty-eight and one half million for work completed, Federal funds supplied 28.38 percent; state funds 41.15 percent; county funds 29.95 percent, and other funds, .52 percent.

Still under construction on August 31st were 1,069.78 miles of original roadway and 1,217.81 miles of stage construction to cost in all about $19,800,000. Principal items are 892 miles of grading to cost $5,337,812 and 514 miles of reinforced concrete to cost $9,222,515. Bridges under construction involve expenditure of $2,599,857. Of these various items about 39 percent has been paid leaving a balance of $13,612,321 to be expended in the present fiscal year. The Highway Department during the past fiscal year spent $410,498 in equipment purchases and $10,416,995 for maintenance. The principal source of revenue was $21,584,665 in receipts from the gasoline tax.

Linn Tractor filling in swampy formation for the new Lake George-Brayton highway. Job completed by R. H. Cunningham & Sons of Pittsburgh, Pennsylvania.

From September 1, 1932 construction contracts let have amounted to approximately $12,737,000. Due to the fact that a special session of the legislature recently enacted legislation by which 1c of the gasoline tax was diverted to a special fund for the retirement of county and road district bond indebtedness, the revenue to the State Highway Department from the gasoline tax will be reduced by one-third. Contributions formerly received from the counties as aid toward construction are not now being received. Due to the uncertainty of what legislation may be enacted by the legislature convening in January further affecting highway construction revenues, it is not possible to make any forecast for Texas construction during the year 1933.

Utah

No reply has been received to our several requests for information.

Vermont

During 1933 it is expected that Vermont will reduce highway construction by 30 to 40 percent. Probably about 40 miles of Federal Aid roads will be graded at a cost of $1,200,000 and 50 miles of State roads at cost of $500,000. Excavation will probably run about 570,000 cubic yards, about 80 percent of which will be suitable for power shovel work. No uncompleted contracts are carried over this year.

Virginia

Highway construction in Virginia is practically on a welfare basis and 1933 work will depend on the requirements for relief employment as developed by spring.

Washington

1932 construction statistics are not yet available according to Samuel J. Humes, Director of Highways. 1933 work is dependent on appropriations which may be made by the legislature which convenes early in January.

West Virginia

It is impossible to give more than an outline of proposed construction work for 1933 at this time owing to the meeting of the legislature in January and the change of administration in March. However, George H. Hill, Office Engineer, has kindly furnished the following information:

There will be construction work carried over from 1932 to 1933 as follows:

Prison Labor Grading	$ 900,000
Prison Labor Stone Base	300,000
State Contracts	4,000,000

Fully 50% of this is Emergency Aid Construction Work for completion June 1, 1933. 90% of it is excavation and draining.

For the year 1933 the amount of funds available are expected to be $2,500,000 of State Road Bonds and $1,100,000 of Federal Aid. No estimate of the mileage of grading, draining and paving is available.

Wisconsin

New grading in Wisconsin for 1932 consisted of 144 miles costing $1,097,255 on Federal Aid and Emergency Relief projects; 204 miles costing $1,624,374 on strictly state projects; some 250 miles of county roads costing about $500,000; and probably about 1000 miles of local roads involving expenditure of around $1,000,000. Reconstruction and widening on Federal Aid and Emergency Relief projects totaled 383 miles at cost of $6,529,716 while State projects run 393 miles and cost $5,130,042. County reconstruction will probably total 400 miles but cost cannot be estimated at this time. Excavation required on new roads will total some 8,000,000 cubic yards and that on reconstruction about 12,000,000 yards. Paving of 400 miles cost close to $10,000,000 and graveling of 388 miles $1,600,000.

About 1,600,000 cubic yards contracted in 1932 will be carried over into 1933, the cost running about $300,000. Wisconsin has used all of the Emergency Federal Relief appropriation available. No forecast can be made for 1933 projects as it seems probable that the taxpayers' demands for economy will be met in part by diverting funds from the gas tax and motor vehicle licenses to other than highway purposes.

Wyoming

The principal work performed during 1932 consisted of grading 267 miles; gravel or rock surfacing 446 miles; and oiling 505 miles at a total contract cost of $3,960,000.

Contractor Harry M. Bates of Steubenville, Ohio, used this Ateco Dirtmover and Bulldozer on a Caterpillar 35 in grading West Virginia roads. The Ateco line is handled west of the Rockies by Blaw-Knox Company of Pittsburgh.

It is impossible to furnish any statement of probable 1933 program other than to say that all Federal Aid funds allotted have been obligated and as no further authorization of Federal Aid funds has been made by Congress, the only funds definitely available at this time are the state funds of about $980,000. It is anticipated that this will be used for asphaltic oil treatment of about 450-500 miles of the primary state highways.

In any case it is impossible that the construction program will be more than 50 percent of the 1932 program.

The work carried over this winter amounts to about $1,000,000 and consists almost entirely of the Emergency Construction program.

Trade Notes

Frank B. Harris, of the Yacht Sales and Service, Inc., 401 North Broad Street, Philadelphia, Pa. has been appointed representative for the Rex-Watson Corporation of Canastota, N. Y., manufacturers of the new patented Watson "Tractor Hitch" Trailers, according to a statement from S. E. Ackerman, General Sales Manager, today.

Mr. Harris has had a broad and successful experience in both automotive and boat merchandising lines for several years past. His territory besides Eastern Pennsylvania, will comprise Southern Jersey, Delaware, Maryland and the District of Columbia.

Arrangements have been made whereby Ingersoll-Rand Co., 11 Broadway, New York has acquired exclusive rights to market SKF drill steel throughout the world. The product is being sold under the trade name IR-SKF.

This brand of steel, which is claimed to be of unusually high quality, was developed as a result of exhaustive tests and experiments by the technical departments of Ingersoll-Rand Co., in collaboration with the SKF mills.

The high power and fast speeds of modern rock drills require a high quality drill steel with long fatigue life to resist breakage and to give fast cutting power. It is said that IR-SKF steel meets these requirements and that at the same time it is easy to shape and sharpen and that it will hold its cutting edge and gauge through a long period of service.

IR-SKF steel is available for immediate delivery in all standard sizes and sections in both solid and hollow forms. The hollow steel is made by the SKF "supersmooth" hole process, which is claimed to produce an absolutely uniform hole throughout the length of the steel.

The Austin-Western Road Machinery Company announces that they will handle the industrial sales and service of Cletrac crawler tractors in the territory covered by the Midwestern, Southern and Southeastern states. This new arrangement of combining the sales of these prominent equipment manufacturers provides from one source a complete sales and service on a broad line of haulage, construction and road maintenance machines, including tractors, graders, elevating graders, motor sweepers, crushing and screening plants, etc. The present Cletrac organization will continue to handle nationwide agricultural sales and industrial sales and service in all territories other than mentioned above.

POSITIONS WANTED

Positions wanted or help wanted advertisements will be run under this heading for 5 cents per word, minimum charge $1.00

Address all box numbers c/o Excavating Engineer at South Milwaukee, Wisconsin

CONSTRUCTION SUPERINTENDENT

I have 20 years' experience as shovel operator, master mechanic, erector of construction machinery and highway foreman. Willing to accept position with any construction company. Can furnish the best of references. Address Box 5103.

DRAGLINE-CLAMSHELL-SHOVEL OPERATOR

Have 20 years' railroad, quarry, drainage, levee and highway experience operating Bucyrus-Erie and Northwest shovels and draglines, gasoline, steam, Diesel and electric machines. Willing to go anywhere on any machine. Can furnish good references and do own repair work. Married. Present location, Indiana. Box 4101.

MINING ENGINEER

Mining Engineer, 34, married, fluent Spanish, desires position with responsible company. Experience — two years assistant engineer gold mine; three years foreman in large underground copper mine; six years foreman to mine superintendent open pit operating 25 electric shovels and draglines. Available immediately. Location, Maryland. Box 3801.

CONSTRUCTION AND MAINTENANCE ENGINEER

Over 25 years' experience on all types of shovel, cranes, locomotives on general construction work. Capable of taking full charge of crew. At present located in Australia. Available for work in New Zealand, China or Federated Malay States. Can furnish excellent recommendations. Address replies to W. J. A., 22 Ruthven Street, Waverly, N.S. Wales, Australia.

ENGINEER-SUPERINTENDENT WANTS CONNECTION WITH CONTRACTOR

Twenty years' exceptional experience in factory construction, rock work, roads, dams, tunnels, hydro-electric developments, foundations. Has produced results under difficult conditions and can handle large program in whole or part. Eight years Latin America. Go anywhere. Box 5102.

DRAGLINE—CLAMSHELL—SHOVEL OPERATOR

Have operated gasoline, electric and steam machines for past 15 years. Willing to go anywhere. Married, 36 years old. Best of references. Can do own repairing. Present location Minnesota. Box 3901.

SHOVEL OPERATOR

15 years' experience on electric, Gas+Air and steam machines on basement excavating; highway and railroad grading. Will go anywhere in U.S.A. Married. Age 35. A-1 references. Can do own repairing. Present location Pennsylvania. Box 3604.

DRAGLINE-CLAMSHELL-SHOVEL OPERATOR

18 years' all around experience on highway, drainage and mine work. Will go anywhere. Can do own repair work. Reliable references. Present location, Florida. Box 3802.

SHOVEL OPERATOR

Have 14 years' experience on Gas+Air, straight gas and steam shovels. Willing to go anywhere in U.S.A. Married. Best of references. Can do own repair work. Present location, Minnesota. Box 3902.

Shovel Operators Attention!

Permanent position for shovel operator who can make substantial investment in sound and profitable enterprise producing material for large middle western market. Give experience and amount you can invest. Ample opportunity for investigation will be afforded. Address Box 5101.

DRAGLINE-CRANE-SHOVEL OPERATOR

Have had 15 years' experience on Diesel, electric and steam machines on levee and stripping operations. Will go anywhere. Married. A-1 references furnished. Can handle own repair work. Present location, Illinois. Box 3803.

FOREMAN—ESTIMATOR—ENGINEER

15 years' experience construction field as above. Age 34, married, war veteran, not afraid of hard work. Graduate University of Wisconsin College of Engineering. Will go anywhere. Excellent references. Available September 1st. Location, Illinois. Box 3703.

TRANSITMAN — OFFICE WORK

Experienced transitman with mining experience desires transit work, or will work as rodman, chainman or engineer's helper. Have also had experience as timekeeper, and much experience in safety work. Good references. Located Wisconsin, will go anywhere. Box 3513.

FOR SALE

Space under this heading is available at the following rates, payable in advance of publication:

1 to 3 inches	$5.50 an inch net
Over 3 to 7 inches	5.25 an inch net
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The price per inch is based on total space used—multiply ad. space by number of continuous insertions.

Address all box numbers c/o Excavating Engineer at South Milwaukee, Wisconsin

Small Shovels
Under 2 Yards

BUCYRUS-ERIE TYPE B STEAM SHOVEL caterpillar mounted, 19-foot 9-inch boom, 16-foot dipper handle. ¾-yard dipper, boom hoist. New 1924. Excellent condition; new flues in boiler. Located near Chicago. Priced to sell. Box 157-SS.

ONE 18-B BUCYRUS-ERIE, ⅞-yard dipper on full revolving caterpillars. Box 182-SS.

OSGOOD GASOLINE ONE-CUBIC-YARD COMBINATION SHOVEL-CLAMSHELL-DRAGLINE. Six cylinder Beaver motor. Overhauled late 1931. Bargain price. Box 323-SS.

Two 20-B Bucyrus steam shovels. Located Aurora, Illinois. Price each $1500.

30-B Bucyrus steam shovel. Located Charleston, Mississippi. Price $1500. Box 303-SS.

FOR SALE

Address all box numbers c/o Excavating Engineer at South Milwaukee, Wisconsin

Small Shovels
Under 2 Yards
Continued

USED P&H MODEL 700 gasoline, combination shovel-dragline, shop number 3007, including 1¼-cubic-yard drag scraper bucket. Dragline boom 40-foot plus 10-foot extension, shovel boom 25-foot 10-inches, dipper handle 19-foot 3-inches, dipper 1¼-cubic-yard. Engine Waukesha Type WL 4 cylinder 6¼"x7". Good condition. Some repair parts on hand. Machine located Tilleda, Wisconsin. Box 378-SS.

NORTHWEST SHOVEL, model 105, caterpillar mounted, 24-foot boom, 1-cubic-yard dipper, 16-foot dipper handle. In good condition. Price $4,500, f. o. b. Utica, New York. Box 34-SS.

BUCYRUS-ERIE TYPE B-2 high lift steam shovel "Cat" mounted. Good operating condition. Will rent. Priced to sell. Box 286-SS.

MARION STEAM SHOVEL, MODEL No. 21, high lift boom, and forward drum, boiler just retubed, location near Baltimore, in excellent condition. Price $3,800.00. Address Box 267-SS.

UNIT MODEL B three-quarter swing, ⅝-cubic-yard Shovel. New 1928. Excellent Condition. Box 350-SS.

BUCYRUS-ERIE TYPE "GA-2" GAS+AIR SHOVEL, shop number 4117, mounted on spur gear drive caterpillar trucks, and equipped with a 24-foot boom; 18-foot, 4-inch dipper handle; 1-cubic-yard manganese cast front socket inserted tooth dipper; power boom hoist; air self-starter, and all equipment and appurtenances in accordance with the specifications of Bucyrus-Erie Company. f.o.b. cars shipping point Virginia. Box 126-SS.

BUCYRUS-ERIE MODEL 1030 Gasoline Friction Shovel slightly used. Rope crowd. 23-foot boom, 15-foot dipper handle. ⅞-yard dipper. Single shaft "cat." New machine guarantee. Box 376-SS.

LINK-BELT GAS SHOVEL one-yard dipper, 22-foot boom, 16-foot dipper handle, Waukesha JL 6"x7" motor. Good operating condition. Box 377-SS.

BUCYRUS-ERIE 1030, ¾-cubic-yard rope crowd gasoline shovel. Factory rebuilt and guaranteed. Box 283-SS.

TYPE B-2 BUCYRUS-ERIE STEAM SHOVEL, number 9830, mounted on single shaft caterpillar type mounting. Equipped with 21-foot 3-inch boom, 16-foot dipper handle, ⅞-cubic-yard inserted tooth dipper. Boom hoist and Mass. standard boiler. Located vicinity of Boston. Reasonably priced. Box 345-SS.

BUCYRUS-ERIE brand new 1035 gasoline shovel, rope chain crowd. Also clamshell or dragline equipment. At price you cannot refuse to consider. Box 356-SS.

BUCYRUS-ERIE GAS+AIR Combination high lift shovel and dragline equipment. Chain drive. "Cats." Very good condition. Located vicinity Chicago. Box 337-SS.

P&H MODEL 600—1-yard Gasoline Shovel. Three years old. Excellent condition throughout. Just been thoroughly overhauled. Will sacrifice at bargain to responsible buyer. Located in Wisconsin. Box 363-SS.

USED TYPE "O" THEW STEAM SHOVEL, shop number about 2100; 20' boom, 16' dipper handle, ¾-yd. dipper. Good running condition. Located Milwaukee vicinity. Bargain. Box 261-SS.

BUCYRUS-ERIE SLIGHTLY USED ½-CUBIC YARD Rope crowd gasoline shovel. Will demonstrate. Box 282-SS.

MARION MODEL 32, shop No. 5459, mounted on "cats," steam-powered, 1¼-cubic-yard dipper, 24-foot boom, 17-foot 6-inch dipper handles. Box 82-SS.

BUCYRUS-ERIE 20-B steam shovel ¾-yard Dipper. $1,000. Chicago territory. Box 348-SS.

BUCYRUS-ERIE TYPE-B high lift steam shovel rebuilt July 1931 including new boiler. Since used 4 months. Excellent condition. Will rent. Box 285-SS.

REBUILT GA-2 BUCYRUS-ERIE SHOVEL mounted on single shaft caterpillar, 1⅛-cubic yard inserted tooth dipper, 22-foot 6-inch boom, 16-foot dipper handle, starter. Carries guarantee of new machine. Box 43-SS.

MARION MODEL 21 AC-DC electric shovel. Shop number about 5500 20-foot boom, 15-foot dipper handle, ¾-cubic-yard dipper. Suitable to operate on power-supply 3-phase 60-cycle 220 or 440 volt. First class condition. Box 208-SS.

ORTON SHOVEL, new 1928. 16-foot 4-inch boom, 12-foot dipper handle. ⅝-cubic-yard dipper. Box 100-SS.

ONE TYPE "B" BUCYRUS-ERIE STEAM MACHINE, mounted on "cats". ¾-cubic-yard dipper, shop number 2301, 19-foot boom and 16-foot dipper handle. Box 83-SS.

MARION TYPE 32 FULL REVOLVING STEAM SHOVEL, shop number 4639, mounted on four belt caterpillar type mounting and equipped with standard boom and dipper handle and 1¼-cubic-yard dipper. Shipping point western Virginia.

This machine should be an excellent purchase at the price offered, for quarry or slag bank operation. Box 212-SS.

INSLEY ½-CUBIC-YARD SHOVEL, full-revolving. Shop number about R-200 (2 years old). Machine in excellent condition. Has had best of care. Located in Wisconsin. Box 238-SS.

20-B BUCYRUS-ERIE STEAM SHOVEL, serial number 4000; caterpillar mounted; 18-foot boom, 12-foot 6-inch dipper handle, 1-yard dipper; shipped new in 1923; located western Missouri. Bargain. Box 241-SS.

If You Do Not Find What You Want Listed—Write Us
Excavating Engineer
South Milwaukee, Wis.

USED BUCYRUS-ERIE 30-B DIESEL SHOVEL—25'9" Boom, 14' Dipper Handle, Box 251-SS.

BUCYRUS-ERIE D-2 DIESEL RECONDITIONED AND GUARANTEED 1-cubic-yard shovel and 40-foot boom dragline equipment. Box 284-SS.

MARION MODEL 36 STEAM STRIPPING SHOVEL, shop number about 4100, 30-foot boom, 18-foot 6-inch dipper handle, 2-cubic-yard dipper, caterpillar mounted. Located near Isabel, South Dakota. Approximately $2000.00 worth of spare parts included. Immediately available. Priced to sell. Box 233-SS.

P&H MODEL 204. Shop number above 2200 combination Shovel Clamshell. 19' shovel boom, 14' 6" dipper handles, ½ cubic yard dipper, 35' clamshell boom, ½ cubic yard Owens Type M digger type bucket. Both front end equipments less than one year old. Excellent condition. Box 254-SS.

BARGAIN

Bucyrus-Erie Type B number 1982, ¾-yard steam shovel on caterpillar mounting with dragline attachment. Ideal for Construction work or Placer mining. Good condition, located Colorado Springs, Colo. Price right. Box 362-SS.

LORAIN 55 Gasoline one cu-yd. Shovel, new April 1929. Excellent condition. Box 270-SS.

THREE TYPE A BUCYRUS-ERIE STEAM SHOVELS. Good value. $500 each.

FOUR TYPE B BUCYRUS-ERIE STEAM SHOVELS. Good operating condition. $1000 each. Box 328-SS.

20-B BUCYRUS-ERIE STEAM SHOVEL, shop number 3743, caterpillar mounted, 20-foot 6-inch boom, 15-foot dipper handle, ¾-cubic-yard dipper. Located near Chicago. Priced to sell. Box 210-SS.

For Sale or Rent

MODEL 7 NORTHWEST dragline, equipped with Kohler lighting plant, 65-foot boom, 1½-yard bucket. Koehring shovel, Model 301. Address replies to Box 361-SS.

FOR SALE—AMERICAN STEAM DITCHER, equipped with ¾-cubic-yard bucket, mounted on flange wheels for off the car service and including caterpillar mounting. Machine in excellent mechanical condition. Located in Southeastern Arkansas. Box 159-SS.

RECONDITIONED TYPE-A BUCYRUS-ERIE STEAM SHOVEL on caterpillars, ⅝-cubic-yard dipper, 16-foot boom, 13-foot dipper handle, boom hoist, Massachusetts boiler. Machine thoroughly inspected, worn parts replaced. Guaranteed to be in first class operating condition. Will rent or sell. Box 37-SS.

20-B BUCYRUS-ERIE DIESEL SHOVEL with 36-foot dragline boom. Machine No. 4133.

20-B BUCYRUS-ERIE STEAM SHOVEL with 36-foot dragline boom. Machine No. 4145.

BUCYRUS-ERIE GAS + AIR CRANE with 40-foot boom, ¾-yard Page Dragline bucket. Fairleads and shovel boom, no dipper stick. Machine No. 4347.

TYPE B BUCYRUS-ERIE High Lift Steam shovel. Machine No. 3110.

Box 373-SS.

BYERS BEARCAT, Model 27, gasoline ½-cubic-yard Skimmer scoop, crane-clamshell and drag shovel with front opening dipper. Engine—4-cylinder, 4"x5" Hercules Model OX. Machine new July 1928. Excellent condition. Box 293-SS.

TYPE B BUCYRUS-ERIE COMBINATION HIGH LIFT STEAM SHOVEL, 19-foot 8-inch boom, 16-foot dipper handle, ⅝-cubic yard dipper, power boom hoist and 36-foot boom clamshell equipment complete. Located central Indiana. Price as is, f.o.b. present location $2,000. Box 311-SS.

ONE P&H MODEL, 208, 45' boom dragline (no bucket). "Cats" 15½' long, 9' wide, 22" treads, 100 H.P. Waukesha High Altitude Engine. Box 249-SS.

FOR SALE OR RENT
Model No. 301 Koehring 1-yard gas shovel on Caterpillar, first-class condition. Box 309-SS.

P&H MODEL 600. New 1929. 20-foot shovel boom, 14-foot 3-inch Dipper handle, 1-yard Dipper. Also 40-foot boom Clamshell Dragline Equipment. Waukesha 75 H.P. Engine. Box 218-SS.

BUCYRUS ERIE So. Milwaukee, Wis.

OFFERS FOR SALE OR RENT
FACTORY REBUILT and USED SHOVELS--CRANES--DRAGLINES

Please send me full details on:

- ☐ B-E ⅞-yd. Gas Shovel. Slightly used.
- ☐ P. & H. 600 1-yd. Shovel-Dragline.
- ☐ B-E 32-B Gas Drgln. 45-ft. boom. Like new.
- ☐ Lorain 55 1-yd. Shovel. A-1 condition.
- ☐ Osgood "Conquerer" 1-cubic-yard gasoline shovel. 6 cylinder Le Roi Engine. Starter battery lighting system. Good condition.
- ☐ Monighan Dragline 60-ft. boom. Priced right.

Name _____

Address _____

FOR SALE

Address all box numbers c/o Excavating Engineer at South Milwaukee, Wisconsin

P. & H. MODEL 206 Gasoline Combination Shovel and Clamshell machine. Good condition. Located vicinity Chicago. Box 336-SS.

THEW "O" ⅝-cubic-yard gas shovel rebuilt 1931 and mounted on new center drive "cat". Box 343-SS.

AMERICAN 1-CUBIC-YARD GASOLINE SHOVEL. Motor overhauled 1932. Excellent condition. Will rent. Box 357-SS.

Small Draglines
Under 2 Yards

BUCYRUS-ERIE TYPE D-2 DIESEL DRAGLINE, shop number 5055, 45-foot boom and 1 cubic-yard Page Class "M" drag bucket. Located Eastern Missouri. Priced to sell. Box 166-SD.

30-B BUCYRUS-ERIE DIESEL DRAGLINE with 40-foot boom and 1-cubic-yard bucket located in Alabama. Box 91-SD.

P & H MODEL 700 DRAGLINE; number 2894 equipped with a 50-foot boom, light 1½-cubic-yard drag bucket, electric light plant, and powered with 4-cylinder Atlas Diesel engine. About 2½ years old. Box 189-SD.

ONE-YARD OSGOOD gasoline combination Dragline-Shovel-Clamshell. Overhauled late in 1931. Six cylinder Beaver motor. Bargain price. Box 323-SD.

BUCYRUS-ERIE E-2 DIESEL DRAGLINE, caterpillar mounted, 50-foot boom, 1¼-cubic-yard Omaha bucket, Kohler lighting plant. Machine was new in July 1930 and has been used less than 6 months. 243-SD.

KOEHRING MODEL 1 GAS DRAGLINE 40-foot boom and Page M ¾-cubic-yard bucket. Good operating condition. Box 374-SD.

FOR SALE OR RENT

One practically new Bucyrus-Erie Model E-2 Dragline, Diesel driven, equipped with 50′ boom and 1½-yard Omaha dragline bucket, now located at Shenandoah, Iowa. Box 244-SD.

P & H DRAGLINE MODEL 700; number 2456 equipped with a 50-foot boom, light 1½-cubic-yard drag bucket, electric light plant, and powered with a Waukesha gasoline engine. About 2½ years old. Box 190-SD.

BUCYRUS-ERIE SLIGHTLY USED 32-B Gasoline 45-ft. boom dragline and 1-yd. Page bucket. Like new. Box 352-SD.

P&H MODEL 700 USED GASOLINE COMBINATION DRAGLINE-SHOVEL, shop number 3007, 40-foot dragline boom plus 10-foot extension and 1¼-cubic-yard drag scraper bucket. 25-foot 10-inch shovel boom, 19-foot 3-inch handle and 1¼-cubic-yard dipper. Waukesha Type WL 4 cylinder 6¼"x8" engine. Good condition. Some repair parts on hand. Machine located Tilleda, Wisconsin. Box 378-SD.

MONIGHAN DRAGLINE, 60-foot boom, mounted on 1-W walker and 1¼-cubic-yard Page bucket. Good condition. Price right. Box 339-SD.

BUCYRUS-ERIE D-2 DIESEL one-cubic-yard shovel. Also 40-foot boom dragline equipment. Reconditioned and carries new machine guarantee. Box 284-SD.

BUCYRUS-ERIE GAS+AIR combination high lift dragline and shovel. Chain drive. "Cats." Excellent condition. Located vicinity Chicago. Box 337-SD.

Small Clamshells and Cranes
Under 2 Yards

BUCKEYE CLAMSHELL-CRANE, gasoline driven, caterpillar mounted, equipped with 30-foot boom, ¾-cubic-yard clamshell bucket, fairleads and backfiller scraper. Located in Milwaukee, Wisconsin. Box 371-SCC.

GENERAL 35-FOOT BOOM CLAMSHELL MACHINE and ⅝-cubic-yard Lakewood bucket. Equipped with four cylinder Buda gasoline engine. Machine new September 1929. Box 355-SCC.

NORTHWEST MODEL 104, combination 45-foot boom clamshell and dragline. Will handle 1¼ cubic-yard bucket. Also 1¼ cubic-yard Pull shovel attachment. Shop number around 1800. Good condition. Will demonstrate. Priced to sell. Box 297-SCC.

SPEEDER GASOLINE, 50-foot boom clamshell and ½-yard Erie Peerless bucket. Bargain. Box 324-SCC.

OSGOOD ONE-YARD GASOLINE combination clamshell-dragline-shovel. Equipped with six cylinder Beaver motor. Overhauled late 1931. Attractively priced. Box 328-SCC.

LITTLE GIANT CRANE—Gas—Caterpillar Model C. Type B—¾-yd. bucket. Recently overhauled. Now working. $1,500.

BROWNHOIST CRANE — Gas — Cats. Model 2-C Serial No. 8829. 1-yd. bucket. Good working condition. $1,500.

McMYLER MODEL J. LOCOMOTIVE CRANE—35 Ton Steam. 50 and 75-ft. Boom. 1½ or 2-yd. buckets. New boiler and swinging engine recently installed. A real crane for long reach and heavy work. Thoroughly overhauled condition. $4,500.

Box 346-SCC.

P. & H. MODEL 206 combination clamshell and shovel. Located near Chicago. Good condition. Box 336-SCC.

Large Shovels and Draglines
2 Yards and Over

BUCYRUS-ERIE 50-B STEAM SHOVEL, number 4751. Equipped with 1¾-cubic-yard bucket. Shipped new August 1926. Priced to sell. Located in East, Box 366-LSD.

Monighan Track Type Dragline; 72-foot boom, 2½-cubic-yard Omaha bucket; Almost new Page Diesel engine; Machine now working northern Illinois. Priced to sell. Box 305-LSD.

50-B STEAM SHOVEL, new March 1927. Shop number about 4950. Has 26-foot boom, 17-foot dipper handle and 2-cubic-yard dipper. Priced to sell. Box 240-LSD.

If You Do Not Find What You Want Listed—Write Us

Excavating Engineer

South Milwaukee, Wis.

BUCYRUS-ERIE SHOP REBUILT 100-B STEAM SHOVEL; shop number 4890; 29-foot 6-in. boom; 20-foot handle; three-cubic-yard dipper. Can be inspected at So. Milwaukee, Wis. Priced to sell. Box 187-LSD.

For Sale or Rent

ONE CLASS-14 STEAM DRAGLINE excavator Number 3327 60-foot boom, 2-cubic-yard bucket, caterpillar mounted, equipped for burning gas or oil. Price very reasonable. Located at Turkey Creek, La. Box 111-LSD.

175-B STEAM SHOVEL No. 4090, equipped with 75-foot boom, 48-foot dipper handle and 3½-cubic-yard dipper. Machine is in very good condition. Oversize boiler. Box 149-LSD.

TWO REAL BARGAINS

2—BUCYRUS-ERIE 50-B STEAM SHOVELS, shop numbers 5109 and 9957. There is also available one set of 50-foot boom dragline equipment without bucket. Box 360-LSD.

MONIGHAN STEAM DRAGLINE, with 123-foot boom, 3½-cubic-yard bucket, mounted on skids and rollers, located southeastern Iowa. Box 367-LSD.

2½-YD. DRAGLINE

Class 220 Page Dragline; 100 H.P. Charter-Horizontal Twin Cylinder engine; 72-foot boom; 2½-cubic-yard Page bucket. Located Northwestern Indiana. Box 200-LSD.

85-C STEAM SHOVEL, on caterpillar mounting, caterpillars in good condition, price $2,500. Located near Hazelton, Pa. Box 163-LSD.

For Sale or Rent

ONE CLASS-14 STEAM DRAGLINE excavator. Number 3402, 70-foot boom, 2-cubic-yard bucket, caterpillar mounted, equipped for burning gas or oil. Priced very reasonable. Located at Grand Prairie, Texas. Box 110-LSD.

68-C BUCYRUS ELECTRICALLY OPERATED SHOVEL, equipped with 2½-yard manganese front dipper, 3 phase, 60-cycle, 440-volt motors, transformers, cable reel and approximately 1400 feet of cable, all in excellent condition. Reasonable price. Address Box 268-LSD.

6-YD. SHOVEL

BUCYRUS-ERIE 320-B electric shovel, Ward-Leonard control, 3 phase, 60 cycle, 2300 volts, equipped with 6-cubic-yard dipper, 85-foot boom and 58-foot handles. Is in good condition and may be inspected in operation. Reasonably priced. Box 279-LSD.

CLASS-24 STEAM, OIL-BURNING DRAGLINE. 100-foot boom. Have also supply of new parts, including 600 new gum rollers. Reasonably priced, subject to buyer's inspection at Chelan, Washington, Box 51-LSD.

3-YD. SHOVEL

BUCYRUS 78-C, caterpillar mounted; three-cubic-yard dipper; shop number 3611. Boom rebuilt last year. Equipped with new 103-C boiler and will pass boiler inspection in any state. Shovel is in very good condition and is in operation at present time. Box 326-LSD.

50-B BUCYRUS-ERIE ELECTRIC SHOVEL, equipped with 3-phase A. C. current, 550 volts, 60 cycle and has three motors. New Manganese steel dipper. Located South Carolina. Box 226-LSD.

50-B DIESEL DRAGLINE; equipped with 50-foot boom, electric light plant, mounted on "cats." Located Vincennes, Indiana. Can be seen at any time. New August 1927. Box 78-LSD.

225-B OWNERS

You may be interested in a partial Bucyrus-Erie 225-B steam shovel located in Kentucky coal fields as a source of spare parts. No reasonable offer refused. Box 211-LSD.

FOR SALE

Address all box numbers c/o Excavating Engineer at South Milwaukee, Wisconsin

Large Shovels and Draglines
2 Yards and Over
Continued

What Do You Bid On a

70-C STEAM SHOVEL located near Marietta, South Carolina, where it completed a railroad job? Bargain as supplementary shovel or as supply of spare parts.

88-C STEAM SHOVEL located in Kansas. Carefully laid up after completing season's work. 3½-yard dipper. Fine condition. Any reasonable offer accepted. Box 52-LSD.

BUCYRUS 80-B STEAM SHOVEL, shop number about 3300; 2-cubic-yard dipper; 48-foot boom; 32-foot dipper handle. "Cat" mounted. Priced to sell. F.o.b. cars. Box 255-LSD.

TYPE 175-B ELECTRIC, No. 794 equipped with 87' shovel boom, 48' dipper handle, 3½-yd. bucket, and dragline equipment including 125' boom, and 3½-yd. bucket. This machine was recently reconditioned and is in good operating condition. Present location, Connecticut. Box 263-LSD.

CLASS-24 BUCYRUS-ERIE STEAM DRAGLINE, shop number 912; 115-foot boom, 3½-cubic-yard Page bucket. Florida location. Box 73-LSD.

SHOVEL FRONT END for 175-B Bucyrus-Erie 65-foot boom, 47-foot dipper sticks and 3½-cubic-yard dipper. Located in Ohio. Box 10-LSD.

If You Do Not Find What You Want Listed—Write Us

Excavating Engineer

South Milwaukee Wisconsin

70-TON STEAM SHOVEL mounted on "cats," caterpillars in good condition. Located near Hazelton, Pa. Box 162-LSD.

DIESEL-ELECTRIC DRAGLINE

Class 14 Diesel electric dragline Shop Number 5079, new fall of 1927 with 70-foot boom, 2-cubic-yard bucket, and with extra 10-foot extension, western location. Box 296-LSD.

70-C BUCYRUS STEAM SHOVEL on Cats. Complete. In operating condition. Shop number 1712. Also one extra three-yard Manganese dipper. Chicago territory. Box 347-LSD.

BUCYRUS 320-B STEAM STRIPPING SHOVEL, shop number 4205, new in 1925, used less than four years. Located at Toronto, Ohio. Box 74-LSD.

MONIGHAN DRAGLINE MODEL T, 2-cubic-yard 60-foot boom located near Wichita, Kansas, where it is now working. About seven years old. Has recently been thoroughly overhauled. Box 180-LSD.

70-C BUCYRUS, 2½ or 3-yard dipper, on caterpillars. Steam. Box 183-LSD.

BUCYRUS 70-C, Shop number around 1500. Thoroughly overhauled. Good working condition. Eastern location. Box 299-LSD.

50-B STEAM SHOVEL, Number 3946; equipped with 1½-cubic-yard dipper, 26-foot boom, also 1½-cubic-yard dragline bucket with 50-foot boom caterpillar mounted, equipped for burning oil, located at Texarkana, Ark. Price very reasonable. Box 112-LSD.

Miscellaneous Equipment

Wanted

A GOOD USED CRUSHER 30 tons or more an hour of 1" material. Give full information and price first letter. Address P. W. Box 594, Warren, Pennsylvania.

WANTED

Used electric welding outfit, 200 ampere capacity. Must be in good condition. Address Box 379-ME.

LOCOMOTIVES

8 BALDWIN, 17x24, straight drive standard gauge 45 ton locomotives, 54 inch boilers. Shop numbers from 32,750 to 34,611. Each one has passed State Boiler Inspection yearly. Boilers will stand cold water test of 240 lbs. At present in actual service in Minnesota mine.

2 BALDWIN Locomotives, 19x26, standard gauge, 6 wheel switching type, shop numbers 39534 and 39536. Box 152-ME.

ARE YOU INTERESTED?

We desire to contract with reliable stripping contractor equipped to remove overburden composed of dirt, shale and sand rock to a depth of forty-five feet. Address Box 380-ME.

TWO 60 CATERPILLAR TRACTORS. Entirely rebuilt and in excellent condition. Located Chicago district. Priced right for quick sale. See them at once. Box 294-ME.

LOOK AT THESE OFFERS

2—MOTORS, type KTR-3953, 8 pole, 21.5 HP, 900 RPM. Form GA- 440 V., 3 phase, 60 cycle, 160 amp. maximum torque 350' lbs. (5 min. 55°C) totally enclosed ball bearing, Model Number 74A157.

2—BLOWERS, Type CW, top horizontal discharge No. 75, Design No. 2, silent vane fan for continuous service, delivery to 7500 RPM direct connected to motor KT-946, 5-HP., 440 Volts, 3 phase, 60 cycle.

1—MOTOR, Type KTP-553-Y, 2 pole, 90 HP. 1500 RPM. Form E, 550 Volts, 3 phase, 25 cycles, 87 amp. speed full load 1440, Model No. 120312, serial No. 4523903.

2—11"x11"x12" WESTINGHOUSE AIR COMPRESSORS.

1—MOON 1 KW TURBO GENERATOR LIGHTING PLANT.

1—50KW MOTOR GENERATOR SET. Induction Motor, Model No. 10059, type KT 347-6-75-1200. Form B, 3 phase, 60 cycles, 440 volts, 93.5 amps. speed full load 1170 RPM. No. 4405940, 75 HP. Continuous, connected to:

GENERATOR—Serial No. 1359597, Compound wound, Form A, Type RC-35, Amps. 200, volts no load 250, speed 1200 RPM. Volts full load 250, 50KW Continuous. Mounted on Sub Base. With suitable rheostat and compensator.

1—GENERATOR Westinghouse 125 KW-250 Volts—500 Amperes, 440 RPM. DC-Generator, Serial No. 4,992,129 with two outboard bearings.

Box 372—ME

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BOILERS

1—100 h.p. Locomotive Type for 70-C Bucyrus shovel.
1—32 h.p. Locomotive Type Stationary.

Box 181-ME

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7—Railroad Type Steam Shovels 2½ to 5 yd.
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3—LOCOMOTIVE BOILERS 44"x17' 75 H. P. Under forced draft. 125 pounds working pressure, 393 sq. ft. heating surface. Heavily built for Railroad Shovel service.

1—PAGE "C" 1-CUBIC-YARD DRAGLINE BUCKET.

Box 332-ME.

FOR SALE

Address all box numbers c/o Excavating Engineer at South Milwaukee, Wisconsin

Miscellaneous Equipment
Continued

1—Whitcomb 9-ton gas, thirty-six-inch gauge locomotive.

5—5-yard Continental dump cars.

Box 310-ME

COMPLETE EQUIPMENT for 2 strip mines, contractors or quarry operations, No. 300 and No. 36 Marion steam shovels, well drills, locomotives, cars, crushers, picking tables, loading booms, cable and button retarders, compressors, motors, transformers, flood and search lights, camp equipment and new repair parts for above. Box 195-ME.

40-FOOT BOOM CLAMSHELL EQUIPMENT COMPLETE, including ¾-yard Blaw Knox rehandling Bucket, suitable for application to Type B or Type B-2 Erie steam shovel. Equipment used only one season. Located central Indiana. Box 327-ME.

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18—BRAND NEW 75 H.P. 7"x8½" STROKE. 4 CYLINDER ATLAS DIESEL ENGINES. Non-reversible. Complete with auxiliary air compressor and fuel tank. Will sell without auxiliary compressor and fuel tank.

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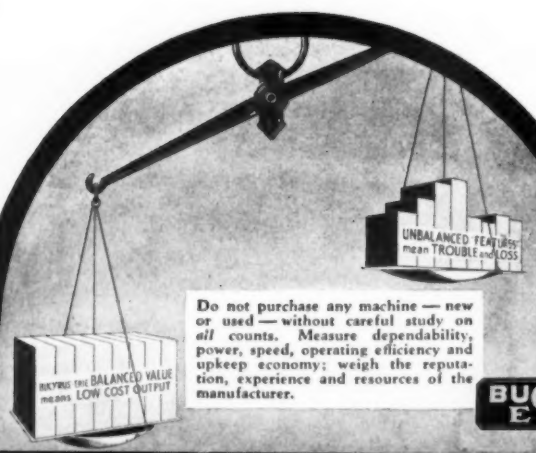

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